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Draft
Environmental Impact Statement
September 1982

Frontier Pipeline Company Crude Oil and Condensate Pipeline

Department of the Interior
Bureau of Land Management

I 1.98:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

IN REPLY REFER TO
1792 FK15
W-77832

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WYOMING STATE OFFICE
2515 WARREN AVE.
CHEYENNE, WYOMING 82001

Dear Reviewer,

This draft environmental impact statement (EIS) on the proposed Frontier Crude Oil and Condensate Pipeline project is submitted for your review and comment. The final EIS will be based on the substantive comments received on this draft. If the results of this review do not cause significant changes in the proposed action, alternatives or impact analyses, an abbreviated final EIS may be prepared. **Please keep this draft EIS for reference in case an abbreviated final EIS is prepared.**

All written comments should be received no later than November 16, 1982, at the address shown on the cover sheet. Comments received after this date may be considered in the preparation of the final EIS but may not be included in the set of comments reproduced for the final EIS.

Comments should be as specific as possible, addressing the adequacy of the scope of the EIS or the impact analyses of the proposed action and alternatives. The purpose of the comment period is to improve the analyses. If the methods used to predict impacts are considered inadequate, the reviewer's comments should describe the rationale and procedures for the preferred methods.

A series of public hearings (see page xv and xvi) will be held to receive comments on the draft EIS. A copy of the final will be sent to all who provide substantive comments on the draft EIS or who request a copy.

This draft incorporates a number of other documents by reference. All referenced documents are reasonably available or may be made available on request. Supporting technical reports may be obtained from the address shown on the cover sheet.

Sincerely yours,

Maxwell T Lieurance

Maxwell T. Lieurance
State Director

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DRAFT ENVIRONMENTAL IMPACT STATEMENT
ON THE
FRONTIER PIPELINE COMPANY CRUDE OIL AND CONDENSATE PIPELINE

Prepared by
BUREAU OF LAND MANAGEMENT (LEAD AGENCY)
AND WOODWARD-CLYDE CONSULTANTS

September 1982

Maxwell T. Lieurance
Wyoming State Director

COVER SHEET

Frontier Pipeline Company
Crude Oil and Condensate Pipeline
Environmental Impact Statement

(X) Draft ( ) Final

Lead Agency

U.S. Department of the Interior, Bureau of Land Management

Cooperating Agency

U.S. Department of the Army
  Corps of Engineers

Abstract

This EIS assesses the environmental effects of granting a 288-mile right-of-way to construct a proposed 16-inch crude oil and condensate pipeline from the Anschutz Ranch East Field in northeast Utah and southwest Wyoming to Casper, Wyoming. The purpose of the project would be to transport crude oil and condensate from the Overthrust Belt area to existing pipeline distribution points in Casper, Wyoming. Alternatives assessed include alternate routes for the proposed pipeline in environmentally sensitive areas, and denial of the right-of-way (no action). The key issues raised in the scoping process are: economic and social effects of construction; effects to wildlife and habitat; effects to cultural resources; and reclamation of disturbed areas. Affected counties in Wyoming would include Uinta, Sweetwater, Fremont, and Natrona counties, and could include Carbon County; and Summit County in Utah.

EIS Contact

Questions and comments on this EIS should be directed to:

Mike Karbs, EIS Project Manager
Bureau of Land Management
Rawlins District Office
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Rawlins, Wyoming 82301

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Date by Which Comments Must Be Received: November 16, 1982 for inclusion in the final EIS.

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PUBLIC HEARINGS INFORMATION

General Information Regarding the Public Hearings for the Draft Frontier Pipeline Company Crude Oil and Condensate Pipeline Environmental Impact Statement

Authority

The hearings are held pursuant to the objective of the National Environmental Policy Act (PL 91-190; 83 Stat. 852, 853).

Purpose

The purpose of the public hearings is to receive comments on the scope of the EIS and the adequacy of the impact analyses of the proposed action and alternatives. Comments received at these hearings will be considered in the preparation of the final environmental impact statement.

Composition of the Hearing Panel

The hearings will be conducted by an official of the Bureau of Land Management. Accompanying the official will be a representative of the consulting firm (Woodward-Clyde Consultants) for this project. The official or representative may ask questions of the person giving comments in order to clarify points in the comments. All comments and proceedings of the hearing will be recorded.

Oral Statements

Persons wishing to present oral comments will be limited to ten (10) minutes. Written submissions will be accepted from anyone attending the hearing.

All persons wishing to present oral comments must register in advance either by mail to the address of the cover sheet or at the registration desk of the public hearing. Advance registration by mail may be done up to one week prior to the date of the public hearing. Those requesting advance registration by mail should include their name, address, organization represented (if any), and the location of the hearing comments will be presented. All persons giving oral comments must state their name and address for the hearing record.

After the last person who signed up to present oral comments has been heard, the conducting official will ask if there are any other persons who wish to give oral comments. After all oral comments have been presented and recorded the hearing will be closed.

Location, Times, Dates of Hearings

October 26, 1982 - 7:00 P.M.

Library of Natrona County
Crawford Room
307 East Second Street
Casper, Wyoming

October 27, 1982 - 7:00 P.M.

Rock Springs Public Library
Ferrero Room
400 C Street
Rock Springs, Wyoming

October 28, 1982 - 7:00 P.M.

Evanston City Council Chambers
1200 Main Street
Evanston, Wyoming

SUMMARY

Frontier Pipeline Company (the applicant) proposes to construct 288 miles of 16-inch common carrier pipeline and related facilities to transport crude oil and condensate from the Anschutz Ranch East Field in northeast Utah and southwest Wyoming to existing pipeline distribution points in Casper, Wyoming. The crude oil and condensate would be subsequently transported to Rocky Mountain and midwestern refineries via existing pipeline systems.

In response to Frontier Pipeline Company's right-of-way grant application to the Bureau of Land Management (BLM), Wyoming State Office (WSO) (Application Number W-77832, filed November 17, 1981), the BLM was designated Lead Agency. The BLM District Manager, Rawlins District, is responsible for the preparation of the Environmental Impact Statement (EIS) in accordance with the provisions of the National Environmental Policy Act (NEPA) and the regulations of the Council on Environmental Quality (CEQ).

The purpose of the proposed pipeline is to transport crude oil and condensate from oil fields in the Overthrust Belt area in northeast Utah and southwest Wyoming to existing transportation points. The maximum design capacity of the pipeline would be approximately 150,000 barrels per day (BPD). Since the proposed pipeline would be a common carrier, the ultimate use and destination of the crude oil and condensate would be determined at the discretion of the various shippers whose material may be shipped in the pipeline.

In compliance with NEPA (40 CFR 1501.7), a public scoping process was conducted in the early stages of preparing this EIS. The scoping process consisted of four public meetings, one meeting with interested state agencies, and one meeting with interested federal agencies. During this process, the scope of issues to be analyzed and significant issues related to the proposed action were identified. Five alternatives were selected for detailed analysis in the Draft EIS--four partial reroutings of the proposed pipeline, and the No Action Alternative (defined as BLM denial of a permit to the applicant for construction and operation of the proposed action).

Construction, operation, maintenance, and abandonment of the following project components were considered in impact analysis:

1. 288 miles of 16-inch outside diameter buried pipeline
2. Four electrically-powered pump stations to reach the maximum design capacity of 150,000 BPD
3. Tankage at the Originating pump station (450,000 barrels)
4. Approximately 17 miles of transmission lines (2400/4160 volts) for supplying electrical service to pump stations
5. Above-ground gate valves and scraper traps
6. Cathodic protection system
7. Right-of-way markers

The EIS consists of four chapters, as well as Appendices which include frameworks for analysis, glossary of terms, references, and topographic location maps. Chapter One addresses the purpose, need, and description of the proposed action and alternatives; authorizing actions; summary of significant impacts; and BLM mitigation measures. Chapter Two describes those components of the affected environment for which impacts or special concern were identified. Chapter Three describes the potential environmental consequences of the proposed action and alternatives. Chapter Four provides a description of consultation and coordination.

After much of the text and the maps in the DEIS were prepared, Frontier Pipeline Company extended the proposed pipeline into Utah (1.2 miles total, 0.4 miles in Utah), including moving the Originating pump station to Utah, subsequent to the initial preparation of this DEIS. To present a complete analysis of this modification in the most efficient manner, Chapter One and the topographic strip maps in Appendix E present the revised project description, but Chapters Two and Three of the DEIS do not address the 1.2-mile pipeline extension or Originating pump station location. The affected environment and environmental consequences associated with the 1.2-mile extension and Originating pump station are addressed in Appendix D. The baseline data in Appendix D was prepared by a separate contractor (Environmental Research and Technology [ERT]), but the assessments of impact significance (based on the data provided by ERT) were done by Woodward-Clyde Consultants. Appendix D also supports 14 of the 16 technical reports, which do not address the 1.2-mile pipeline extension or Originating pump station. The Energy Use and Oil Spill Analysis technical reports fully consider the revised project description (i.e., include assessment of the 1.2-mile pipeline extension and Originating pump station).

A fundamental approach to this EIS is reflected in Chapter One (Purpose, Need, and Description of Proposed Action and Alternatives). Numerous construction methods and resource considerations are specified as part of the proposal. Implementation of these procedures for construction, operation, maintenance, and abandonment was assumed for the purpose of impact analysis. Inclusion of these applicant-proposed considerations and practices, in part, accounts for the low number, magnitude, and duration of environmental impacts.

Detailed impact analyses were conducted for the following resources and topics:

- Land Use Controls and Constraints
- Climate
- Air Quality
- Noise
- Geology (Geological Hazards)
- Mineral Resources
- Vegetation (including Threatened and Endangered Species)
- Livestock Grazing
- Aquatic Biology (including Threatened and Endangered Species)
- Wildlife (including Threatened and Endangered Species)
- Wild Horses
- Paleontology
- Soils
- Agriculture (Cropland)
- Prime and Unique Farmlands
- Water Resources (including 100-Year Floodplains)
- Social and Economic Conditions
- Transportation
- Recreation
- Wilderness
- Visual Resources
- Cultural Resources
- Energy Use
- Oil Spills

Potentially significant adverse impacts were identified for the proposed action in the areas of Wildlife, Social and Economic Conditions, and Visual Resources. Unknown impacts for the proposed pipeline were identified for Paleontology, Threatened and Endangered Wildlife Species, Cultural Resources, and Spill Effects. All other resource analyses produced findings of no impact or no significant impact. These analyses and their findings are documented in the technical reports which are on file at the BLM Wyoming State Office in Cheyenne and the following BLM District Offices: Rock Springs, Rawlins, and Casper. No additional significant adverse impacts were identified for the 1.2-mile pipeline extension and Originating pump station (refer to Appendix D).

No known significant impacts were identified for any of the alternative routes. Comparisons of potential impacts for each set of alternatives (refer to Map 1-1 located on page 1-3) resulted in the following findings:

Comparison One: Proposed Route (milepost [MP] 214.75-259.1) versus Beef Gap Alternative (ADEGHI) versus Beulah Belle Lake Alternative (BCDFGHJL) versus County Line Alternative (BKL)

General

Proposed Route. This portion of the proposed route is approximately 44.35 miles long and would result in the disturbance of about 538 acres during the construction phase. Approximately 17 percent of this portion of the proposed route parallels existing utilities or roads.

Beef Gap Alternative. This alternative route is approximately 44.5 miles long and would result in the disturbance of about 539 acres during the construction phase. Approximately 28 percent of the Beef Gap Alternative parallels existing utilities or roads.

Beulah Belle Lake Alternative. The Beulah Belle Lake Alternative is approximately 47.4 miles long and would result in the disturbance of about 575 acres during the construction phase. Approximately 53 percent of this alternative route parallels existing utilities or roads.

County Line Alternative. This alternative route is approximately 47.75 miles long and would result in the disturbance of about 579 acres during the construction phase. Approximately 31 percent of this alternative route parallels existing utilities or roads. The County Line Alternative completely avoids the Sweetwater Rocks Wilderness Study Areas (WSAs). The proposed route and the Beef Gap and Beulah Belle Lake alternatives all come close to the boundaries of WSAs. Although no WSA boundaries are actually crossed by any of the routes, the County Line Alternative completely avoids the aforementioned areas which are considered to be environmentally sensitive.

Vegetation. This portion of the proposed route traverses 5 miles of the sand dune forb-grass vegetation type, versus 4 miles for the Beef Gap Alternative, 1 mile for the Beulah Belle Lake Alternative, and 0 miles for the County Line Alternative. This comparison is presented due to the potential revegetation and reclamation problems associated with the sand dune forb-grass vegetation type.

Wildlife.

Proposed Route. This portion of the proposed route would disturb 7.5 miles of pronghorn crucial winter range, 13.25 miles of pronghorn crucial winter/yearlong range, and 3 riparian habitat areas.

Beef Gap Alternative. The Beef Gap Alternative would disturb 7.5 miles of pronghorn crucial winter range, 2.5 miles of pronghorn crucial winter/yearlong range, and 3 riparian habitat areas.

Beulah Belle Lake Alternative. The Beulah Belle Lake Alternative would disturb 14.0 miles of pronghorn crucial winter range, 3.5 miles of pronghorn crucial winter/yearlong range, and 5 riparian habitat areas.

County Line Alternative. The County Line Alternative would disturb 18.5 miles of pronghorn crucial winter range, 15.5 miles of of pronghorn crucial winter/yearlong range, and 7 riparian habitat areas.

Paleontology

Proposed Route. This portion of the proposed route traverses one identified fossil locality and comes within 1 mile of an additional identified fossil locality.

Beef Gap Alternative. The Beef Gap Alternative traverses one identified fossil locality and comes within 1 mile of an additional identified fossil locality.

Beulah Belle Lake Alternative. The Beulah Belle Lake Alternative does not traverse any identified fossil localities, but does come within 1 mile of two identified fossil localities.

County Line Alternatives. The County Line Alternative does not traverse any identified fossil localities, but does come within 1 mile of two identified fossil localities.

Visual Resources

Proposed Route. This portion of the proposed route and the three alternative routes all pass south of the BLM Split Rock Interpretive Site and Viewing Area. A significant visual impact was identified for the portion of the proposed route that goes through U.T. Gap.

Beef Gap Alternative. No significant visual impacts were identified for this alternative route. The Beef Gap area has more visible disturbances (i.e., pipeline ROWs and 2-track road) than the U.T. Gap area (i.e., 2-track road); thus the Beef Gap area is considered to be less susceptible to visual impacts associated with a new pipeline ROW.

Beulah Belle Lake Alternative. No significant visual impacts were identified for the Beulah Belle Lake Alternative. This alternative route goes through Beef Gap and is similar to the Beef Gap Alternative from a visual standpoint.

County Line Alternative. Although the County Line Alternative traverses the southern portion of the historic Devils Gate BLM Interpretive Site and passes by historic Independence Rock, it generally follows an existing linear development (State Highway 220) in these areas. No significant visual impacts were identified for this alternative.

Cultural Resources

Proposed Route. The Class I overview identified 5 known cultural resource sites (2-prehistoric, 3-historic; 3 nominated for the National Register of Historic Places [NRHP]) within a one-mile-wide study area along this portion of the proposed route.

Beef Gap Alternative. The Class I overview revealed no known cultural resource sites within a one-mile-wide study area along the Beef Gap Alternative.

Beulah Belle Lake Alternative. The Class I overview revealed no known cultural resource sites within a one-mile-wide study area along this alternative route.

County Line Alternative. The Class I overview identified 11 known cultural resource sites (2-prehistoric, 9-historic; 2 nominated for the NRHP, and 1 is considered eligible for inclusion on the NRHP) within a one-mile-wide study area along the County Line Alternative.

Comparison Two: Proposed Route (MP 267.75-281) versus Emigrant Gap Alternative (M)

General. Approximately 78 percent of the Emigrant Gap Alternative parallels existing utilities or roads, versus about 23 percent for this portion of the proposed route. The Emigrant Gap Alternative would result in the disturbance of about 0.5 additional miles or about 6 acres more than the corresponding portion of the proposed route. Comparisons for selected resources are presented below.

Wildlife.

Raptors. Neither the Emigrant Gap Alternative nor the corresponding portion of the proposed route come within 0.5 mile of any raptor nests. This portion of the proposed route traverses 4 miles of a bald eagle winter concentration area near the Jackson Canyon ACEC and the North Platte River in Natrona County, Wyoming. No significant adverse impacts were identified for the bald eagles which utilize this area.

Riparian Habitat. The Emigrant Gap Alternative traverses 6 riparian habitat areas versus 1 riparian habitat area for the corresponding portion of the proposed route.

Cultural Resources. The Class I overview identified 10 known cultural resource sites (8-prehistoric, 2-historic; 1 is on or nominated for inclusion on the NRHP and 1 is eligible for inclusion) within a one-mile-wide study area along the Emigrant Gap Alternative, versus 13 sites (8-prehistoric, 5-historic; 4 of the sites are on or eligible for inclusion on the NRHP) for the corresponding portion of the proposed route.

Based on these findings, the Agencies' Preferred Alternative for Comparison One is the County Line Alternative. For Comparison Two the Agencies' Preferred Alternative is the Emigrant Gap Alternative.

CHAPTER ONE

PURPOSE, NEED, AND DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

1.1 INTRODUCTION

Frontier Pipeline Company (the applicant) proposes to construct a 16-inch outside diameter common carrier pipeline and related facilities. The pipeline is proposed for the transportation of crude oil and condensate from the Anschutz Ranch East Field in northeast Utah and southwest Wyoming to existing pipeline distribution points in Casper, Wyoming. The crude oil and condensate would be subsequently transported to Rocky Mountain and midwestern refineries via existing pipeline systems.

Frontier Pipeline Company is a Wyoming general partnership jointly owned by Amoco Pipeline Company, Anschutz Corporation, Calnev Pipeline Company, and Lakehead Pipeline Company. On November 17, 1981, under Application Number W-77832, Frontier Pipeline Company applied to the Bureau of Land Management (BLM) Wyoming State Office in Cheyenne for a 50-foot-wide right-of-way (ROW) grant across public lands. The applicant's proposed route is approximately 288 miles long and would have a maximum design capacity of 150,000 barrels per day (BPD). The applicant has also requested an additional 50 feet of width for temporary use during construction.

The BLM was designated Lead Agency for preparation of this Environmental Impact Statement (EIS) in accordance with the provisions of the National Environmental Policy Act (NEPA) and the regulations of the Council on Environmental Quality (CEQ). The BLM District Manager, Rawlins District, would issue (under the authority of Section 28 of the Mineral Leasing Act) the Grant of Right-of-Way, and amendments thereto for federal lands. Associated permits (use authorizations) for federal lands would be issued by the appropriate BLM District Manager or Resource Area Manager.

1.2 NEED AND PURPOSE

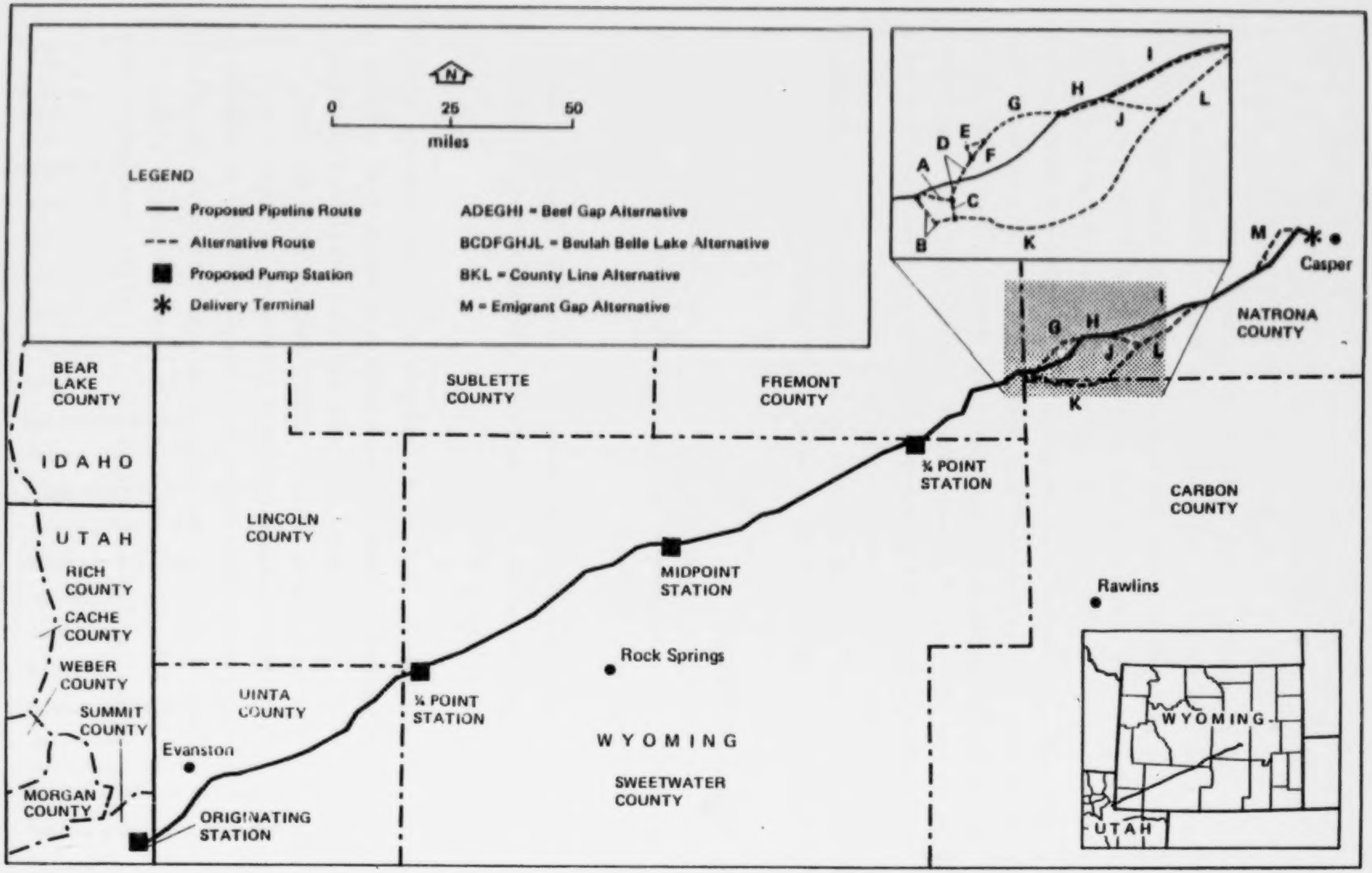
The applicant (Frontier Pipeline Company) estimates that by 1983 crude and condensate production from new and existing fields in the Overthrust Belt area will exceed the capacity of both Salt Lake City area refineries and an existing 8-inch diameter crude oil pipeline transporting crude east. At a maximum, the proposed pipeline would transport 150,000 BPD of surplus crude oil and condensate from oil fields in the Overthrust Belt area in northeast Utah and southwest Wyoming to existing pipeline distribution points in Casper, Wyoming. Subsequent distribution would be by existing pipelines to refineries in the Rocky Mountain area and/or Midwest. Since the proposed pipeline would be a common carrier, the ultimate use and destination of the crude oil and condensate would be determined at the discretion of the various shippers whose materials may be shipped in the pipeline.

1.3 PROPOSED ACTION AND ALTERNATIVES

PROPOSED ACTION

Route Description

Map 1-1 shows the general location of the proposed route and pump stations. Specific locational details (topography, towns, etc.) are shown on Maps 1 through 6 in Appendix E.



Map 1-1. GENERAL LOCATION OF PROPOSED PIPELINE ROUTE AND ALTERNATIVES

The proposed pipeline route is approximately 288 miles long and has a maximum design capacity of 150,000 BPD. As summarized in Table 1-1, the proposed pipeline (including pump stations and transmission line ROWs) would directly affect approximately 3624 acres of federal, state, and private lands during construction, and 1878 acres during operation. The buried pipeline would not traverse any lands under the jurisdiction of the National Park Service (NPS), i.e., National Parks and National Monuments, or lands in trust for an Indian or Indian Tribe. No existing or proposed Forest Service Roadless Area Review Evaluation II (RARE II) or BLM Wilderness Study Areas would be crossed. The proposed action would not affect any Prime and Unique Farmlands. The proposed pipeline would be near existing pipelines and utilities for approximately 57 miles or 20 percent of its length.

Project Components

Construction, operation, maintenance, and abandonment of the following six components of the proposed pipeline were considered in the environmental analysis.

1. Approximately 288 miles of 16-inch outside diameter buried pipeline, using a 50-foot wide ROW and 50 feet of temporary construction space.

2. Ultimately, four electrically-powered pump stations would be required to reach the maximum design capacity of 150,000 BPD. Pump station discharge pressure would be 1440 pounds per square inch or less. Pump stations would be located adjacent to existing roads and as shown in Table 1-2. Horsepower requirements would range from 3000 to 4000 HP at each location. The Originating pump station at the Anschutz Ranch East Field would require a maximum area of about 25 acres, as shown on Figure 1-1. A typical intermediate pump

Table 1-1. OWNERSHIP OF LANDS AFFECTED BY PROPOSED ACTION AND ALTERNATIVES

COUNTIES, STATES	BLM			STATE			PRIVATE			TOTAL		
	Miles	Construction Acreage[a]	Operational Acreage[b]	Miles	Construction Acreage[a]	Operational Acreage[b]	Miles	Construction Acreage[a]	Operational Acreage[b]	Miles	Construction Acreage[a]	Operational Acreage[b]
Proposed Action												
Summit, UT	0	0	0	0	0	0	.4	5	3	.4	5	3
Uinta, WY	21	255	127	1	12	6	43.8	531	266	65.8	798	399
Sweetwater, WY	81	982	491	4	48	24	36	436	218	121	1466	733
Fremont, WY	24	291	145	1	12	6	4	48	24	29	351	175
Natrona, WY	25	303	152	7	85	43	40	485	242	72	873	437
TOTAL[c]	151	1831	915	13	157	79	124.2	1505	753	288.2	3493	1747
Beef Gap Alternative												
Natrona, WY	23.5	285	143	7	85	42	14	170	85	44.5	540	270
Beulah Belle Lake Alternative												
Natrona, WY	20.8	252	126	13	158	79	13.6	165	82	47.4	575	287
County Line Alternative												
Natrona, WY	11	134	67	13	158	79	11	134	67	35	426	213
Carbon, WY	12.25	148	74	0	0	0	.5	6	3	12.75	154	77
TOTAL	23.25	282	141	13	158	79	11.5	140	70	47.75	580	290
Emigrant Gap Alternative												
Natrona, WY	.75	9	5	2	24	12	11	134	67	13.75	167	84

[a] Assumes a 100-foot wide construction ROW.

[b] Assumes a 50-foot wide operational ROW.

[c] The four pump stations associated with the proposed action would require an additional 28 acres (fenced area) during the operational phase, and the transmission line ROWs associated with the proposed Midpoint and 3/4 Point pump stations would require about 103 additional acres.

Table 1-2. LOCATION OF PROPOSED PUMP STATIONS[a]

Name	State	County	Land Ownership	Township	Range	Section	Approximate Milepost	Elevation (Feet)
Originating	UT	Summit	Private	4N	8E	20/21	-1.2[b]	7350
1/4 Point	WY	Sweetwater	Private	18N	111W	5/6	68	6300
Midpoint	WY	Sweetwater	Private	23N	102W	30	127	7400
3/4 Point	WY	Sweetwater	Public	26N	94W	1	185	6900

[a] Pump station data is applicable for the alternative routes as well.

[b] Refer to Map 1 in Appendix E for an explanation of the use of negative mileposts.

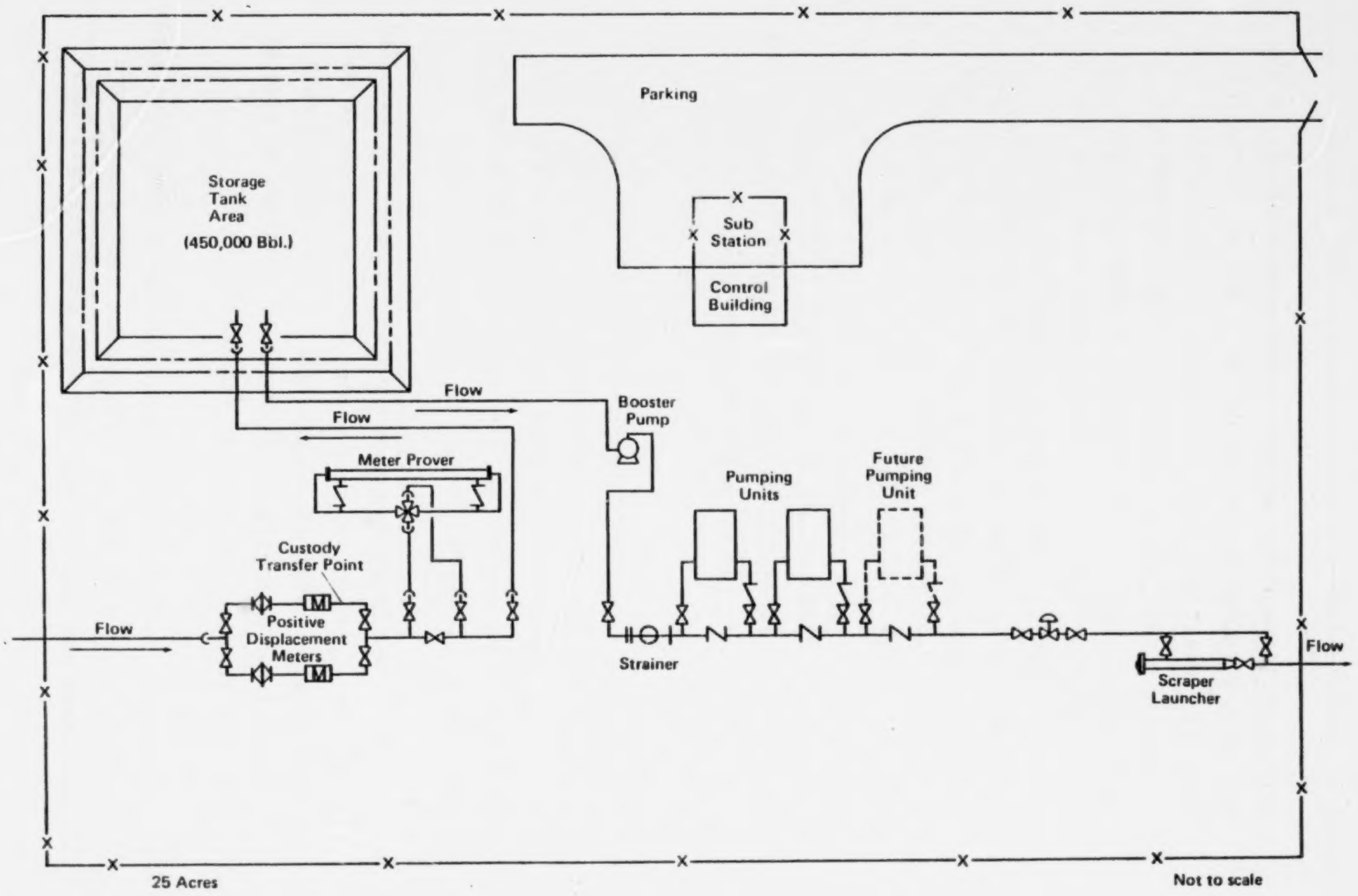


Figure 1-1. ORIGINATING PUMP STATION

station would require a maximum leased area of 400 ft. x 400 ft., with a fenced-in area of 200 ft. x 200 ft. (about one acre) for actual operation (see Figure 1-2 for typical intermediate pump station details). Communications from each pump station would be by means of leased telephone circuits, if available, or by a microwave tower (100 ft. maximum height) or radio antenna. Electrical service (2400/4160 volts) would be installed at each pump station. Electrical power is available at all proposed pump station locations except for the Midpoint and 3/4 Point stations. The approximate transmission line lengths for the aforementioned pump stations are as follows: approximately 10 miles for Midpoint; and approximately 7 miles for 3/4 Point. Refer to Maps 1 through 6 in Appendix E for the power source locations and the approximate transmission line routes.

3. Storage tank construction (approximately 450,000 barrels) would be required at Anschutz Ranch East Field (Originating station). The proposed tankage location is on private land. The tanks would be painted white and equipped with cone roofs with internal floaters.

4. Between 10 and 16 above-ground gate valves would be installed along the pipeline, and gate valves would be located on both sides of major river crossings. Two or three above-ground scraper traps with gate valves would be installed as part of the pump stations and delivery terminal.

5. To minimize corrosion of pipe, in addition to protective pipe coating, about five cathodic protection units consisting of rectifiers and subsurface ground beds would be installed.

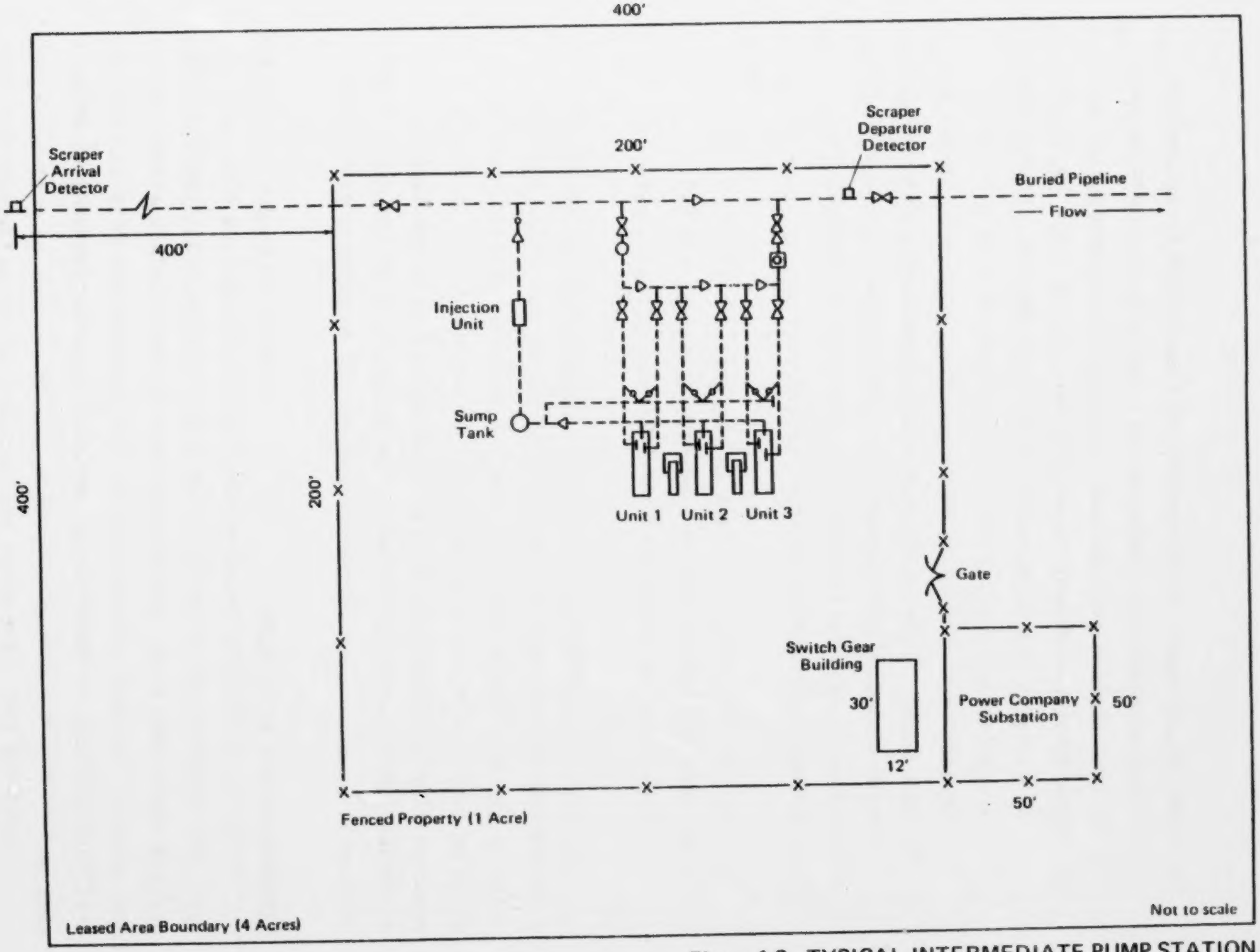


Figure 1-2. TYPICAL INTERMEDIATE PUMP STATION

The exact number and locations of these would be determined after construction, based on field surveys to determine unit sizes, minimum pipe-to-soil potential requirements, and minimum interference with other systems. Units would be located as close as possible to existing power sources. Rectifiers are enclosed in metal containers (about 18 x 18 x 32 inches in size) attached to an H-Frame support or a pole (about six feet high). Service wires would be installed either overhead or buried from the nearest source of electricity. Corrosion control test stations would be installed to monitor the cathodic protection system.

6. Markers would be installed in the size, color, type, location, and number required by regulations of the U.S. Department of Transportation (DOT).

Construction of new access roads is not planned for construction or operation of the proposed pipeline. Wherever possible, existing roads or the ROW itself would be used for surface travel. Improvements to some of the existing roads may be necessary for access to proposed pump station sites during operation. Use or construction of any roads across public lands would require a ROW from the BLM. Roads used would be maintained during and rehabilitated after construction.

Preconstruction Activities

Prior to initiating construction-related activities, the applicant would either purchase or otherwise secure ROW easements from private landowners whose property intersects the pipeline route. A ROW easement (in most cases) results from negotiations between the applicant and private landowners, and addresses the concerns of both parties.

Owners, tenants, and lessees of private land, and lessees and users of public lands in the ROW, would be notified in advance of construction activities that could affect their property, business or operations. Notification would be by personal visit or mail a few days before beginning construction. Ranchers would be advised of fence openings, disturbances to range improvements, or other range use related activities in advance of construction.

A preconstruction plan (Operating Plan) would be developed for BLM lands in accordance with 43 CFR 2882.2-4(c), "Management of Oil and Natural Gas Pipelines". The Authorized Officer of the BLM would require detailed plans for construction, operation, maintenance, and abandonment of the pipeline system. At a minimum, the plans would include:

- schedules and costs for construction of the pipeline and all related facilities
- measures for the protection of the environment during construction, operation, maintenance, and abandonment of the pipeline
- procedures for emergency repair of any rupture during operation, containment of spilled material, and restoration of areas which may have been damaged.

Pipeline Construction Methods

Construction activities would normally be confined to the 50-foot permanent ROW and the 50-foot temporary use space for construction (Figures 1-3 and 1-4) along the proposed route. Only that portion of the ROW needed for construction would be cleared. Typical construction activities require clearing above-ground vegetation and obstacles from an average 50-foot width of the ROW to allow safe and efficient operation of the construction equipment. Any activity

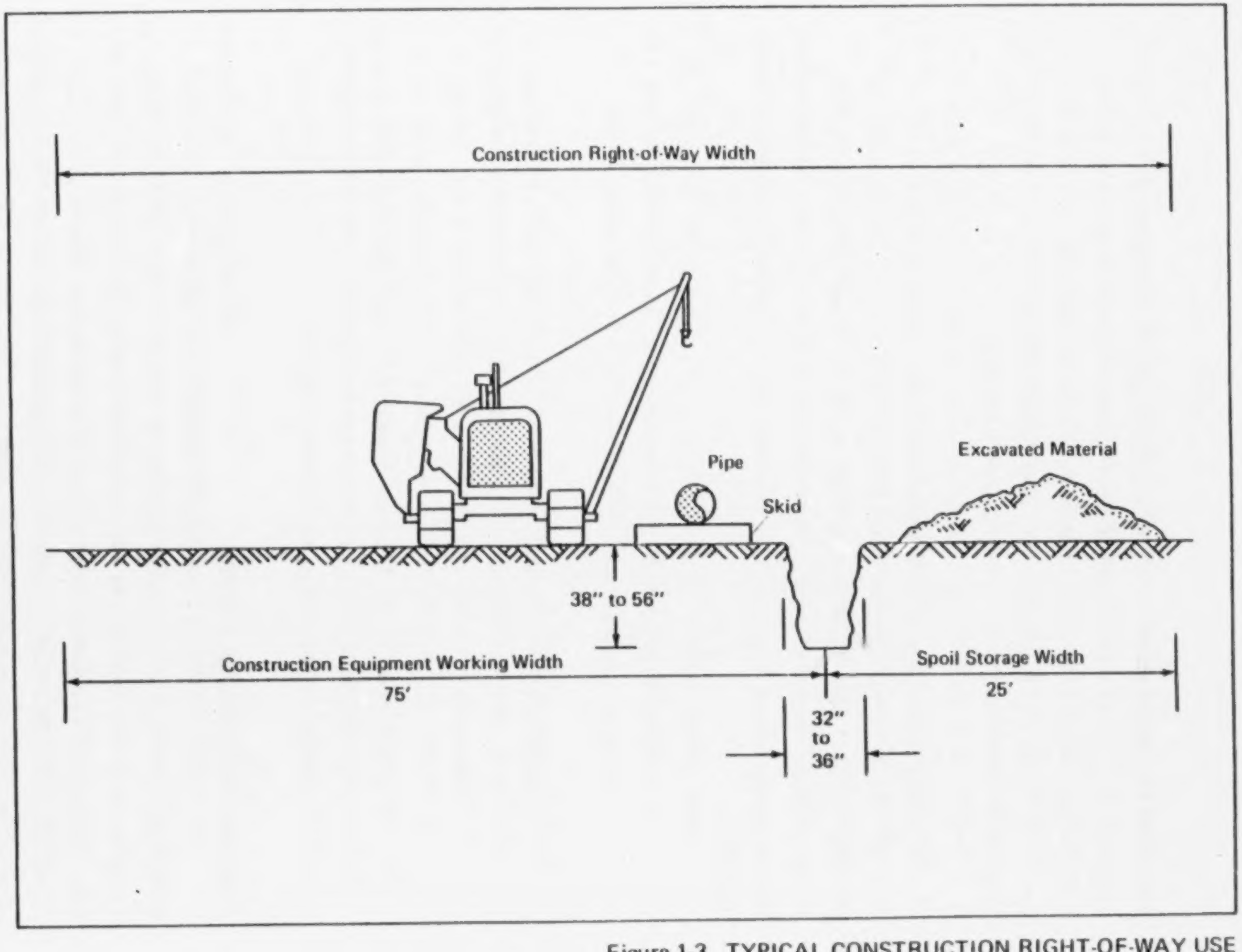


Figure 1-3. TYPICAL CONSTRUCTION RIGHT-OF-WAY USE

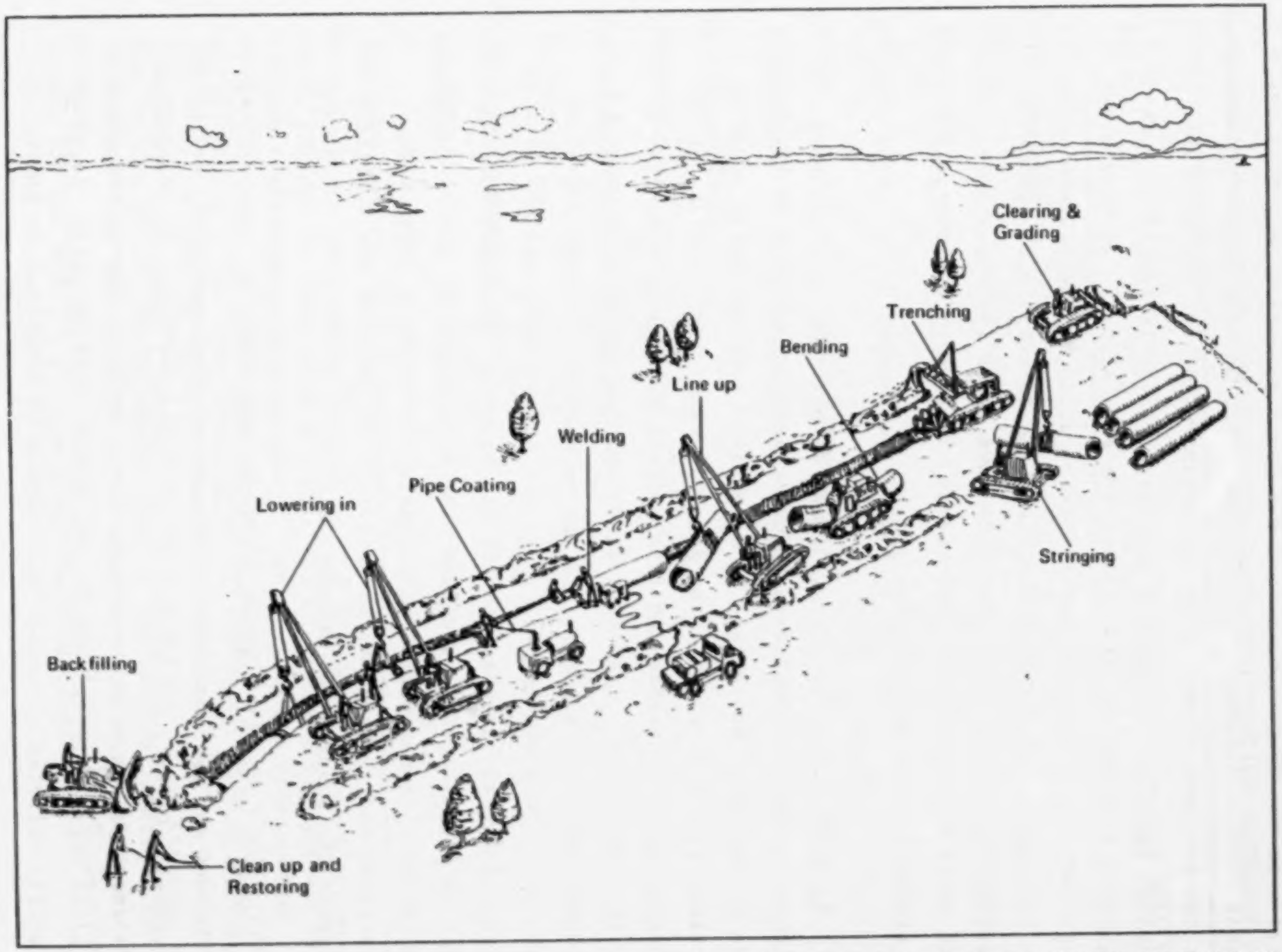


Figure 1-4. TYPICAL CONSTRUCTION ACTIVITIES

outside of the 50-foot permanent ROW would require a temporary use permit (TUP). Blading of the ROW would not be done unless necessary for the movement of machinery and equipment or for the ditching required for the installation of pipe. For instance, it is sometimes necessary to blade in areas with steep side slopes. In some areas of rough terrain, a 100-foot ROW clearance would be the minimum necessary for safe and efficient construction. Due to terrain or proximity of existing facilities, there would be some areas for which more than 100 feet would be needed. In these cases, it is possible that a TUP would be needed for the additional area.

To ensure vehicle safety, it may be necessary to construct temporary bridges or culverts across creeks and arroyos on the working side of the ROW. Where this is necessary, road materials would be obtained either from: (1) the ROW, (2) commercial sources, or (3) adjacent lands by permission from surface management agencies or private landowners. Grading and cut-and-fill excavation would be performed so as to minimize effects on natural drainage and slope stability. On steep terrain or in wet areas, where the ROW must be graded at two elevations (two-toning) or where diversion dams must be built to facilitate construction, the areas would be restored upon completion of construction to resemble the original conditions. Excavation and grading may be necessary to increase the stability and decrease the gradient of unstable slopes.

Working areas of approximately 200 feet (road or river front) x 400 feet would be needed on each side of road, railroad, and river crossings. Major river crossings are listed in Table 1-3. Precise size and location of these working areas would be determined after detailed engineering analysis. The river crossing points would be carefully selected to reduce disturbance of riverbeds or banks.

Table 1-3. MAJOR RIVER CROSSINGS[a] FOR PROPOSED ACTION AND ALTERNATIVES

River	County	Township	Range	Section	Approximate Milepost
Proposed Route					
Bear	Uinta	14N	119W	7	12
Black's Fork	Uinta	18N	113W	34	57
Black's Fork	Sweetwater	19N	110W	10	78
Green	Sweetwater	20N	109W	25	86
Sweetwater	Natrona	29N	88W	17	223
Beef Gap Alternative					
Sweetwater	Natrona	29N	89W	21	3
Beulah Belle Lake Alternative					
Sweetwater	Natrona	29N	89W	16	5
County Line Alternative					
Sweetwater	Natrona	29N	86W	16	23

[a] Of the rivers and streams crossed by the proposed action and alternatives, major rivers are identified as those for which the applicant may need to develop a site-specific construction design plan for construction contractor use. At the present time it appears that no river crossings would require a U.S. Army Corps of Engineers' (COE) Section 10 Permit (33 USC 403). A site-specific 404 Permit (33 USC 1344) may be required for the crossing of the Green River due to its width. It is anticipated that the Nationwide 404 Permit would apply to the balance of stream and river crossings. The applicant is responsible for obtaining COE-required permits. Application will be made by the applicant for COE Section 10 Permit (33 USC 403) (Eng. Form 4345) where required.

Storage areas required for equipment, pipe, and other materials would be acquired through private permission or temporary use permits.

Where fences are encountered along the ROW, adequate bracing would be installed at each edge of the ROW prior to cutting the wires and installing temporary gates. The opening would be controlled as necessary during construction to prevent the escape of livestock. Upon completion of construction, the applicant would close the gap with a locked gate or other approved closure. No gates or cattleguards on established roads over public land would be locked, blocked, or closed by the applicant without the approval of the Authorized Officer. Any cattleguard damaged by the applicant would be repaired to its original condition or replaced. If a natural barrier used for livestock control is damaged during construction, the applicant would adequately fence the area in such a manner to equal the effectiveness of the existing natural barrier.

Once the ROW has been prepared, stringing, welding and ditching operations would begin. The construction of the proposed pipeline would be divided into four spreads. Construction activity for all four spreads would begin simultaneously. A ditch, 32-36 inches wide and 38-56 inches deep, would be centered on a line about 25 feet away from one edge of the ROW, thus providing 75 feet of working space and 25 feet of area in which to place ditch spoil (Figures 1-3 and 1-4). The ditch would be excavated mechanically with ditching equipment. The ditch of each construction spread would normally be open no more than seven miles at any time. In areas where loose or unconsolidated rock is encountered, the ditch would be excavated using backhoes and clamshell buckets. An exception to mechanical excavation would be hand-digging to locate and cross under buried utilities, such as other pipelines and cables.

The depth of the ditch would vary with the conditions encountered. The cover from the top of the pipe to the ground level would generally be at least three feet thick. However, in areas where rocks are removed by blasting, the cover would be 30 inches in industrial, commercial, and residential areas and 18 inches in open country. In areas where it is impracticable to comply with the above cover dimensions, additional protection would be provided that would be equivalent to the minimum required cover. These depths and those discussed above would be in conformance with DOT's 49 CFR 195, Transportation of Liquids by Pipeline. Occasionally, the ditch would be excavated to depths greater than the stated minimums. For instance, when the pipeline traverses specific locations for which there are definite plans to level the land for irrigation or other purposes, the pipe would be buried at a depth that would accommodate these plans. When crossing canals, borrow ditches, or irrigation ditches that are dredged to maintain depth, the pipeline would be ditched underneath to a depth that would permit safe dredging operations. At railroad and road crossings, the depth of the ditch would conform to appropriate regulations. At these crossings, the applicant's specifications require a minimum of four feet of cover over the pipe at borrow ditches, and five and one-half feet of cover between the pipe and the road or railroad.

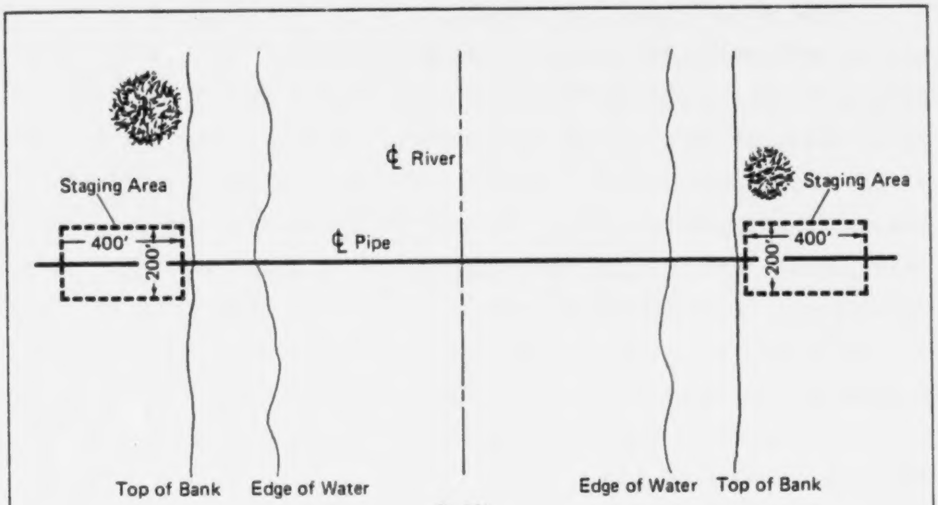
Generally, ditching operations would employ ditching machines in open areas and backhoes near rivers or in areas providing little working space; however, subsurface conditions may require different types of excavation. In areas where loose or unconsolidated rock is encountered, the ditch line may be ripped mechanically. This process would involve a tractor dragging a long shank (ripper-tooth) behind it to dislodge the material. The dislodged material would then be removed using a backhoe.

When solid rock is encountered, jackhammers or blasting would be used. Blasting would be used as little as possible and only where necessary. A mobile drill would be used to bore the blasting holes. Normally, the effects of blasting are confined to the ROW. If rock is inadvertantly scattered outside the ROW, it would be removed and buried within the ROW.

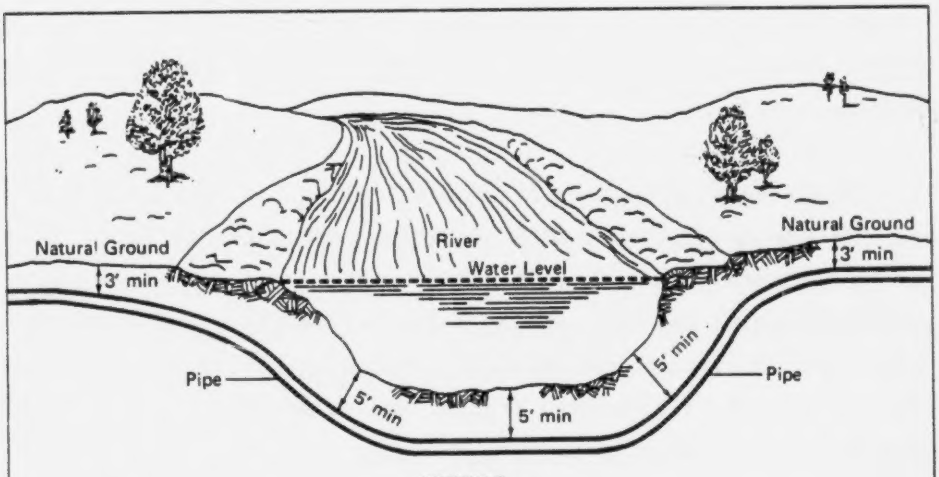
Where blasting is necessary, the following safety precautions would be taken:

- In areas of human use and near transmission and telephone lines blasting would be blanketed (matted)
- Landowners or tenants in close proximity to the blasting would be notified in advance so that livestock and other property could be adequately protected
- Before blasting the affected area would be checked to ensure that construction personnel and equipment and local residents are out of danger.
- Blasting would be controlled or limited where damage to rock mass might create slope instability.

Rivers would not be crossed during periods of high flow (usually late spring). Figure 1-5 illustrates a profile and plan for a typical river crossing. Construction of each crossing would be accomplished within two weeks. The ditch would be excavated to the depth that minimizes the effect of scour action to the pipeline during periods of high flow. Cover over the pipeline in the streambed would be a minimum of five feet beneath the maximum scour depth. Where rock blasting is required, the cover would be 18 inches.



PLAN
(not to scale)



PROFILE
(not to scale)

Note: The burial depth shown is where the river bottom materials are earth, sand or gravels.

Figure 1-5. PLAN AND PROFILE OF TYPICAL RIVER CROSSING

Reconstruction of streambeds would be consistent with COE requirements for Section 404 permits. Normally, the ditch would be graded on each approach to the river to fit the natural sag of the pipe. The ditch would be deep enough to minimize potential exposure of the pipe at the banks. An effort would be made to minimize the effects of construction on water flow. As near as practical, the gradient of the stream would be restored upon completion of construction. Stream banks would be restored to resemble their original grade and breakers or riprap would be placed over the pipeline along riverbanks where necessary for erosion control. The pipeline would be coated with a concrete jacket to offset buoyancy, thereby ensuring that it remains in the underwater ditch.

During construction of river crossings, the drainage or storm runoff from riverbank staging areas would be controlled by use of straw bale filters, where necessary, to ensure that levels of suspended solids, grease or oil do not exceed ambient receiving water standards.

Roadbeds that support railroads would be crossed by boring a hole beneath the bed rather than by ditching across the surface. Casing would be installed at these roadbeds and at road crossings where they are required by federal, state, local, or railroad authorities. All paved and improved roads would be crossed by boring under them if possible. Gravel, dirt roads, trails, and unimproved roads would be ditched and restored.

Stringing, ditching, bending, welding, coating, lowering, tying-in, backfilling, and cleanup are the usual steps that follow ROW preparation. The pipe would be placed along the ROW prior to the ditching operation. All girth welds to be placed beneath railroads, highways, and rivers would be radiographically inspected before installation. As a minimum, all tie-ins, all sections of pipe in populated areas, and at least ten percent of the remaining welds would be radiographically inspected in all other locations. The pipe would either be precoated or coated over the ditch with protective materials and then lowered directly into the ditch. In rocky areas, the bottom of the pipe would be padded to provide a uniform bearing surface for the pipe. Once in the ditch, the pipe would be padded with fine materials (sand or soil), where necessary to protect its coating during backfill operations. The sand or soil would be obtained from private sources or in an approved manner. The pipeline would be protected from corrosion through the use of pipe coating and a cathodic protection system.

Backfilling operations would be conducted with an effort to minimize further disturbance to vegetation. Backfill material that could not be placed in the ditch would be crowned on top of the ditch to compensate for future settling, or otherwise disposed of. Backfill would be graded and compacted where necessary for ground stability by being tamped or walked-in with a wheeled or track vehicle. Once the ditch has been backfilled, the ROW and any other areas affected would be cleaned of trash, brush and other debris to prevent fire hazards. The ROW would be graded where needed and all disturbed surfaces would be restored to approximately the preconstruction grade.

Completed construction areas (including the ROW) and access roads no longer required would be returned as nearly as practicable to original condition and level of productivity or to that agreed upon between the applicant and the landowners or the Authorized Officer. Restoration of areas disturbed by pipeline construction would be accomplished by whatever means is most suitable for the soils, terrain, climatic conditions and surrounding vegetation. Preparation of seedbed and reseeding where desirable would be accomplished by the applicant, and the seed mix or plant species would be planted in accordance with techniques customarily used for the area and in accordance with agreements made with landowners or the appropriate surface management agency.

In areas having difficult reclamation problems (dune soils, excess salts/alkalinity, rock outcrop, etc.), revegetation would be considered a special management problem to be resolved in coordination with the surface management agency or landowner. It may be necessary to solicit advice for such problem areas from other agencies, such as the Soil Conservation Service, to determine appropriate mitigative and reclamation measures.

Where present, original topsoils would be saved, and later placed on top of the excavated ditch to hasten recovery of cultivated or grazing lands. Depending on the erosion condition of the soil, erosion control, as necessary, would be employed on the ROW and along any cuts made through unconsolidated materials. Some soils may require that special measures be used. All reasonable means would be undertaken to control erosion and soil damage resulting from construction, rehabilitation, or maintenance and operations, including (but not limited to) construction of water bars, or other water diversion structures, and implementation of soil stabilization measures in erosion prone areas.

The entire pipeline would be hydrostatically tested to a minimum of 125 percent of maximum operating pressure in compliance with DOT safety standards (49 CFR 195, Transportation of Liquids by Pipeline). Water for hydrostatic testing would be obtained through agreements consistent with local, state and federal regulations and ordinances.

The estimated maximum volume of water required for proposed pipeline testing would be 45.4 acre feet (1222 barrels per mile). Actual water use would probably be less, since the test water can be recycled (i.e., used more than once). The test water would be disposed of in accordance with federal, state, and local agency requirements.

Construction Work Force and Schedule

The 288 miles of proposed pipeline would be constructed simultaneously by four spreads. Approximate locations of spreads are as follows:

1. Originating Station to MP 67
2. MP 67 to MP 140
3. MP 140 to MP 220
4. MP 220 to Casper

Each of the spreads would have a crew of about 100 to 125 workers. Each of the four pipeline sections would be constructed by contractors under the applicant's inspection. The teams would require about 55 to 65 percent skilled workers and 35 to 45 percent unskilled workers. It is likely that construction workers would seek housing and related services in the following towns: Casper, Jeffrey City, Rawlins, Rock Springs, Green River, Granger, Evanston, Fort Bridger, and Lyman. Pipeline construction is scheduled for May through November of 1983. Construction of pump stations would occur simultaneously with pipeline construction and would require 10 to 20 temporary construction workers per station.

Applicant's Mitigation

The applicant would undertake a number of construction and restoration practices in addition to those already mentioned. The resource considerations outlined below are intended to reduce environmental impacts.

Air and Water Quality. The applicant would conduct all activities associated with the project in a manner that would avoid or minimize degradation of air, land, and water quality. During construction, operation, maintenance, and termination of the project, the applicant would perform all activities in accordance with applicable air and water quality standards, and related plans for implementation, including but not limited to standards adopted pursuant to the Clean Air Act, as amended (42 USC 7401 et seq.), and the Federal Water Pollution Control Act, as amended (33 USC 1251 et seq.).

Geologic Hazards. Areas with potential geologic hazards are currently being investigated by an engineering geologist to assess the potential hazard and, if necessary, assist in designing location-specific mitigation. Site specific plans will then be developed, reviewed, and implemented with conditions reviewed or verified during construction.

The applicant is currently assessing the potential for hazardous geologic conditions to affect the safety of the proposed or alternative routes in the areas listed in Table 1-3. The results of this assessment will be presented in the Final Environmental Impact Statement.

In addition, through normal engineering practices, the final design of the pipeline and pump stations will take into account flooding potential, shrink/swell soils, and routing through sand dune areas.

Herbicide Use. A BLM-approved herbicide would be used within the fenced area at the pump stations and within tank firewalls to prevent weed fires, and around safety signs and block gate valves within the ROW so they remain visible. Herbicides would be approved by the BLM prior to use.

Table 1-4. AREAS SUBJECT TO GEOLOGIC HAZARDS

Approximate Mileposts	Type of Hazard	Remarks
Proposed Route		
MP 18-25	Landsliding	Currently, a landslide area is mapped as extending across the proposed route. Geologically similar conditions exist in this area and will be evaluated before final design. Because of the topography and other development in the area, the entire segment of MP 0-30 will be evaluated for instability prior to final design.
MP 20	Mine collapse	This area of the proposed route may be affected by collapse of old underground coal mine workings or surface disposed mine wastes. The presence of such conditions will be evaluated prior to final design.
MP 38-46 57-58 128-131 135-146 230-232 240-243	Sand dunes	Crossing of sand dune areas may require special routing procedures to prevent change in dune patterns.
MP 78-90	Subsidence	Underground mining of trona may have initiated subsidence that may progress and eventually cause ground collapse. The potential of the subsidence to affect the integrity of the pipeline during the life of the project will be evaluated prior to final design.

Table 1-4. AREAS SUBJECT TO GEOLOGIC HAZARDS (concluded)

Approximate Mileposts	Type of Hazard	Remarks
Proposed Route (continued)		
MP 80-90	Stream channel erosion	Aggregate extraction can increase bank erosion and change stream gradient, thereby changing scour depth. This will be evaluated at the proposed Green River crossing.
Beef Gap Alternative		
MP 15-17 25-28	Sand dunes	Crossing of sand dune areas may require special routing procedures to prevent change in dune patterns.
Beulah Belle Lake Alternative		
MP 16-18	Sand dunes	Crossing of sand dunes areas may require special routing procedures to prevent change in dune patterns.
County Line Alternative		
MP 0-47.75	None identified	
Emigrant Gap Alternative		
MP 0-13.75	None identified	
Proposed and Alternative Routes		
Entire routes	Other geologic hazards	Relatively minor localized hazardous conditions may exist elsewhere along the proposed and alternative routes. Such conditions will be identified during the survey of the pipeline route and considered in the final design.

Traffic Safety. Adequate warning signs would be positioned far enough in advance of construction zones so that drivers would have sufficient warning to decelerate safely. Signs would be positioned in accordance with relevant regulations.

Recreation Resources. Construction of the project may occur during months when recreational use is high. The following measures would be taken during the construction period to reduce potential adverse effects:

- Temporary detours would be constructed around the construction zone where secondary access roads do not exist.
- Detour routes would be established using the nearest available secondary access routes.
- The work force would not use public campgrounds or forests for temporary housing; however, recreational use of these facilities can not be denied to workers.

Paleontological Resources. A paleontological field inventory of portions of the proposed route identified one significant fossil locality (T21N, R106W, Section 20) which could be impacted during pipeline trenching operations. The applicant has agreed to have this site monitored and carefully examined during the construction phase in order to mitigate potential impacts to this site.

Cultural Resources. Prior to initiating any ground disturbance, the applicant would take all required actions to protect cultural resources in accordance with the historic preservation process memorandum of agreement currently being developed between the Bureau of Land Management, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation.

Public Monuments and Markers. Where the ROW includes public lands on which cadastral survey monuments and markers are located, the applicant would avoid disturbance or removal of such monuments and markers. If the removal of monuments or markers becomes necessary during specific construction activities, the applicant would advise the appropriate agency of that need. Removal and/or relocation would then be done in accordance with detailed instructions set forth by the appropriate agency.

Timber Removal. In the event it becomes necessary to remove timber from the ROW lands, all merchantable timber would be purchased by the applicant at the fair net market price.

100-Year Floodplains. Final project design for pump stations would include consideration by the applicant of 100-year flood stage elevations.

Compliance Check and Monitoring

Preconstruction conference(s) would be held with contractor(s), the applicant and Authorized Officer to clarify procedures and expectations to enable efficient implementation of all requirements. Compliance checks would be made throughout construction by the representative of the Authorized Officer. When all developments and rehabilitation have been completed, a final joint compliance check of the ROW would be made by a representative of the applicant and the Authorized Officer or his designated representative. The purpose of this check would be to determine compliance with the terms and conditions of the ROW grant. The applicant would perform, at its own expense, any required monitoring, modifications or additional reclamation work needed to comply with the terms and conditions of the ROW grant.

Operation and Maintenance

Aerial patrols would inspect the ROW at least once every two weeks. Surface traffic would be limited to monthly reading of the rectifiers, valve inspections which occur at least once every six months, and to annual corrosion surveys, ROW maintenance, and emergency repairs to the pipeline, which are DOT requirements. A maximum operating and maintenance staff of about 10 to 20 permanent employees would be needed to operate and maintain the pipeline. About five to seven of these would be located in Casper, with as many as five employees hired locally and trained for work. The rest would be assigned in towns along the route. The pressures, flow rates and status information of the system would be telecommunicated from the pump stations to the applicant's operating headquarters planned for Casper, Wyoming, and monitored by a supervisory control system and personnel on a 24-hour per day basis.

It is possible that operation and maintenance of the system would be assumed by the Amoco Pipeline Company's Casper operation crews. In this case, total added personnel would be seven to ten employees.

Ruptures and Emergency Procedures

Frequency of Occurrence. Leaks from pipelines are low-frequency events. Leak causes can be categorized by one of the following:

1. Corrosion. This can be external where the soils encountered are corrosive, or internal where the product being transported is itself corrosive. The oil that Frontier would be transporting is not considered corrosive. Protective coating and cathodic protection would be employed to mitigate external corrosion.

2. Structural Failure. This is caused by either a defect in the pipe or exposure to excessive pressures. Pieces of defective pipe should be detected during shop inspection, visual inspection prior to welding, radiographic inspection of the welds, and hydrostatic testing. Defective pipe will be replaced as it is detected. The operating pressures will be strictly monitored during operation to avoid structural failure due to excessive internal pressure.

3. Outside Forces. These are caused by people or forces, outside of Frontier Pipeline Company's control, accidentally striking the pipe. ROW markers would be used in potential accident areas (e.g., railroad, road, and other pipeline crossings) to minimize this hazard.

4. Miscellaneous. This includes such sources as tankage, valves, pump seals and other potential sources of accidental spills around stations that may occur during routine operations and maintenance. Frontier Pipeline Company would employ state of the art preventive maintenance in accordance with 49 CFR 195, to minimize the potential for accidental spills.

Frontier Pipeline Company would employ the latest available technology in pipe coating, cathodic protection, structural testing, marking and warning signs, and continuous monitoring to help mitigate these factors. However, as a further precaution, an educational program for oil spills would be conducted in accordance with DOT 195.402 and 440. The program would include notification of agencies, American Petroleum Institute (API) bulletins, ROW markers, and an emergency phone number. One of the main purposes of this program would be to enable the public to recognize a liquid pipeline emergency and how to report it to the appropriate Frontier Pipeline Company office.

Emergency Procedures. An Emergency Procedures Handbook would be prepared in compliance with DOT 49 CFR Part 195, Transportation of Liquids by Pipelines. All operation and maintenance personnel would be thoroughly educated as to the contents of the Emergency Procedure Handbook. It would be the responsibility of the headquarters operator in Casper, Wyoming to identify and control conditions along the pipeline route. The headquarters would be attended 24 hours a day, seven days a week. Supervisory equipment and operators would continuously monitor pipeline pressure and flow conditions at key points. The supervisory equipment would give audible and visual alarms any time there is a change in status of the pipeline system.

The indications of a hazardous condition may come from several sources--a telephone call from a member of the public, by radio from an aerial patrol pilot, or alarm from the supervisory equipment. Upon receiving a report from any of these sources, the operator would immediately implement emergency procedures--the first priority being to secure the area to reduce the possibility of damage to persons or property. The sequence of response action would be as follows:

1. Confirm the probable location of the leak, using all the information available, including pressure and flow conditions from the supervisory control system.

2. Shutdown upstream pumping facilities, close appropriate valves on the line or to storage tanks in order to reduce oil spillage.

3. Dispatch people by road, assisted by the aerial patrol pilot if needed, to the scene of the leak to close other valves, establish roadblocks, evaluate hazard, warn people, and in general prevent damage to life and property. The estimated maximum response time required to complete these tasks is four hours.

4. A company employee in charge at the leak site would determine the proper way of controlling the liquid spill to minimize damage to people or property and the procedures necessary for repairing or replacing the affected portions of the pipeline.

5. Simultaneous with these actions, the nearest pipeline maintenance crew would be notified and directed to the leak site with the necessary repair and safety equipment.

6. During the repair, the supervisor in charge would demand strict adherence to all safety rules.

7. Simultaneous with these actions, an official of Frontier Pipeline Company would notify the appropriate federal, state, and local regulatory agencies and/or organizations of the event

8. Emergency booms and skimmers would be employed as appropriate on any streams that are endangered by the spill. The booms would contain the spilled oil, and vacuum tank trucks would be used to pick up puddles of oil from the ground or from the water surfaces. Riparian areas would be cleaned up by either: 1) using high-pressure water spray with an EPA-approved detergent to wash the oil into the watercourse where it would be contained with a boom and skimmed; or 2) removing contaminated vegetation and soil from the site by truck. Additionally, in terrestrial or riparian areas, removed soil would be replaced with fresh soil and revegetated where necessary. The estimated response time required to travel to the spill site and deploy the equipment is four to six hours.

9. After repairs have been completed, the control center operator would be notified and the valves opened and pumps started to refill the line and put it back in service. While the line is being refilled, the leak location would be observed to make sure satisfactory repairs have been made.

10. A complete report as required by 49 CFR 195 would be made showing all data obtained and action taken, from time of notification or suspicion of a leak to final repair and return to operations. The report would include the conditions at the leak site, damage to the area or people, repair procedures employed, and final cleanup of the area.

11. This report and facts associated with it would be reviewed and critiqued by company officials to determine improvements that can and would be made in the emergency procedure plan. Copies of this report would be made available upon request to the Authorized Officer and other appropriate agencies.

Interrelationships of Proposed Action with Other Planned Projects

Projects that are in the planning stages in Uinta, Sweetwater, Fremont, Carbon, and Natrona counties, Wyoming, were examined to determine which ones are likely to be in the construction phase during 1983. Any such projects which would coincide with the proposed construction period for the Frontier project, could potentially cause cumulative socioeconomic impacts.

The only other identified project which has proposed construction activity in 1983, is the Chevron chemical phosphate project. This project would be generally located south of Rock Springs in Sweetwater County. During 1983, the peak construction work force associated with this project would be about 1200 people, most of which would locate in the Rock Springs area. As part of the project, Chevron plans to provide housing for their work force, most likely in the form of a camper-trailer development to be located approximately 5 miles south of Rock Springs (Unger 1982). More specific information regarding Chevron's proposed housing program will be made available following formal submittal of their Wyoming Industrial Siting Council (ISC) application (currently in preparation) to the ISC. Provision of housing for the Chevron work force would significantly reduce the potential for cumulative socioeconomic impacts. Schedule and work force demands for the Chevron chemical phosphate project were considered in the assessment of cumulative socioeconomic impacts.

ALTERNATIVES

The alternatives described in this section are a result of several months of initial information collection, including the scoping process, consultation with surface management agencies, and field reconnaissances. Because of these opportunities to improve information over time, the proposed route differs somewhat from the routing originally proposed by Frontier Pipeline Company in November 1981. In recognition of potential resource problems, Frontier Pipeline Company made some realignments to the proposed route.

As major alternatives or changes to the originally proposed routing were suggested, an effort was made to select those alternatives which provided reasonable alternatives to the proposed action for detailed impact analysis.

The four types of alternatives identified for consideration were:

1. Alternative routings for segments of the proposed route

2. Transportation of crude oil and condensate by truck and/or rail

3. Larger pipeline diameter

4. Alternative methods for river crossings (e.g., span over)

Other modes of transportation (e.g., truck and/or rail) from the Anschutz Ranch East Field to Casper would clearly not provide an environmentally or economically better option to the proposed action, because of the large numbers of trucks and/or rail cars required to transport this volume of material; thus this alternative was dropped from further analysis. Using a larger pipeline diameter (which could preclude the potential need for additional pipelines in the future) was also excluded from further analysis, because this common carrier pipeline proposal currently represents the largest diameter (16-inch outside diameter) which can be economically justified by the applicant, based on current and forecasted estimates of demand in the proposed service area. Alternative river crossing methods such as suspending the pipe over rivers were excluded from further analysis due to safety considerations.

Alternative Routings

Numerous route variations to portions of the originally proposed route and alternatives (i.e., alternative routings) were identified by the BLM and the applicant. Several alternative routings, which avoid potential coal leasing areas and wilderness study areas (WSAs), were subsequently incorporated in the proposed route. The alternatives which remain were selected to either: avoid sensitive wildlife areas or areas considered relatively undisturbed; or to follow existing utility rights-of-way or roads. Areas potentially affected by the proposed route, which are considered to be environmentally sensitive, include: the Sweetwater Rocks area in Natrona County; and a bald eagle winter concentration area along the North Platte River near the Jackson Canyon Area of Critical Environmental Concern (ACEC) in Natrona County.

Originally, Frontier Pipeline County was considering the possibility of routing the pipeline through Wamsutter, where additional product would be picked up and transported to Casper. This option was dropped by the applicant when it was determined to be economically infeasible.

The alternative routes evaluated for the DEIS are shown on Map 1-1. The detailed locations of alternative routes are shown on the maps in Appendix E. Descriptions of the alternative routes evaluated for the DEIS follow.

Route Descriptions

Beef Gap Alternative. This approximately 44.5-mile-long alternative route would depart the proposed route at about MP 214.75. This alternative follows an existing two-track road between two WSAs and up through Beef Gap. The Beef Gap Alternative follows two existing pipelines or roads for about 12.25 miles (28 percent) versus about 7.5 miles (17 percent) for the corresponding portion of the proposed route. This alternative is about 0.15 mile longer than the corresponding portion of the proposed route.

Beulah Belle Lake Alternative. The Beulah Belle Lake Alternative is approximately 47.4 miles long and would depart the proposed route at about MP 214.75. The Beulah Belle Lake Alternative also follows an existing two-track road between two WSAs. Additionally, this alternative follows two existing pipelines or roads for approximately 25 miles (53 percent). The Beulah Belle Lake Alternative is approximately 3 miles longer than the corresponding portion of the proposed route.

County Line Alternative. This approximately 47.75-mile-long alternative route would also depart the proposed route at about MP 214.75. This alternative does not come near any WSAs, although it does pass through the southern part of historic Devils Gate BLM Interpretative Site and passes by historic Independence Rock (adjacent to State Highway 220 in these areas). The County Line Alternative parallels existing pipelines or roads for about 14.75 miles (31 percent). This alternative is approximately 3.4 miles longer than the corresponding portion of the proposed route.

Emigrant Gap Alternative. The Emigrant Gap Alternative is approximately 13.75 miles long and would depart the proposed route at about MP 267.75. This alternative parallels existing utilities or roads for about 10.75 miles (78 percent), versus about 3 miles (23 percent) for the corresponding portion of the proposed route. This alternative also completely avoids the bald eagle winter concentration area along the North Platte River in Natrona County, which is traversed by 4 miles of the proposed route. The Emigrant Gap Alternative is approximately 0.5 mile longer than the corresponding portion of the proposed route.

No Action Alternative

The No Action Alternative was considered to be an alternative to the proposed action. The No Action Alternative represents BLM denial of the Grant of ROW for the proposed action.

Land Ownership

The ownership and acreages of land that would be directly affected during construction and operation of each alternative route are listed and summarized in Table 1-1. Major river crossings which might require U.S. Army Corp of Engineers' (COE) permits and site-specific construction design plans are listed in Table 1-3 for each applicable alternative.

Construction and Operation Practices for Alternatives

If any of the alternatives are selected, the applicant would undertake construction and operation using the same practices and procedures as specified under the discussion of the proposed action earlier in this chapter.

1.4 AUTHORIZING ACTIONS

In order to implement Frontier Pipeline Company's proposal, several authorizing actions would be needed from certain federal, state, and local authorities. Authorizing actions are approvals that take the form of right-of-way grants, stream crossing permits, microwave communication licenses, and other special-use permits. Given the proposal, the following authorizing actions would be needed prior to beginning pipeline construction.

FEDERAL

Bureau of Land Management (BLM)

The BLM is responsible for authorizing the actions listed below and for coordinating the preparation of ROW stipulations by affected federal agencies to ensure consistency between agencies.

1. Issuance of a Grant of ROW for construction and operation of pipelines and associated facilities (pump stations, power and communication lines, access roads, and cathodic protection system). The ROW for federal lands would be issued under the authority of the Mineral Leasing Act of 1920, as amended (30 USC 185), and in accordance with the regulations in 43 CFR 2880, Oil and Gas Pipelines. The Grant of ROW would be issued by the BLM Rawlins District Manager.

2. Just prior to construction, issuance of temporary use permits for temporary work and storage sites at major river crossings, highway and railroad crossings, other utility crossings, and temporary access roads. These permits would be issued from the appropriate BLM District or Resource Area Office.

3. Issuance of an undetermined number of Noncompetitive (Negotiated) Sales of Mineral Material (commercial fill, sand and gravel, and other surfacing or construction material of common variety) under 43 CFR 3611, Noncompetitive Sales. These would be issued by the appropriate BLM District or Resource Area Office.

The BLM is also responsible for compliance with certain applicable federal laws, orders and regulations. For this project they are:

- Endangered Species Act of 1973 (as amended), Section 7, in accordance with 50 CFR 402, Interagency Cooperation, requires consultation and coordination with U.S. Fish and Wildlife Service (including Threatened and Endangered Species clearances);

- Executive Order 11593 (Protection and Enhancement of the Cultural Environment) and the Historic Preservation Act of 1966 (as amended), Section 106, in accordance with 36 CFR 800 (Protection of Historic and Cultural Properties), requires consultation with State Historic Preservation Officer, and the Advisory Council on National Historic Preservation;

- Executive Order 11988, Floodplain Management; and

- Wild Horse and Burro Act.

U.S. Army Corps of Engineers (COE)

Under Section 404 of the Clean Water Act of 1977 (33 USC 1344), as implemented by COE regulations (33 CFR 323), the placement of dredged or fill material for bedding or backfilling pipeline crossings is permitted under the nationwide permit for utility lines (33 CFR 323.4 and 323.4-3) provided that certain conditions are met. However, the COE does have discretionary authority to require individual permits for all or portions of the pipeline crossings if the District Engineer determines that the concerns of the aquatic environment indicate a need for such action (33 CFR 323.4-4). On the basis of project description information supplied by the applicant, COE District Offices in Sacramento and Omaha will determine whether an individual permit is required.

U.S. Environmental Protection Agency (EPA)

Under Section 402 of the Clean Water Act of 1977, the applicant may be required to obtain a National Pollutant Discharge Elimination System (NPDES) Permit from the EPA (Region VIII) for hydrostatic test water discharges in Utah. The draft permit is also reviewed by the Utah State Department of Health, Bureau of Water Pollution Control.

U.S. Fish and Wildlife Service

The Endangered Species Act of 1973 (as amended), Section 7, in accordance with 50 CFR 402, Interagency Cooperation, requires consultation and coordination with the U.S. Fish and Wildlife Service (including Threatened and Endangered Species clearances).

Federal Communication Commission (FCC)

The FCC requires application for an operating license for certain microwave communication systems. Should Frontier Pipeline Company require a microwave station(s), it would submit application Form 402 for license in the Operational Fixed Microwave Service. Authority for issuing the microwave licenses is contained in Volume V, Parts 90 and 94 of 47 CFR of the FCC Rules and Regulations, which govern private repeater stations.

STATE

The applicant is responsible for obtaining needed grants and permits from the following Utah and Wyoming state agencies.

Utah State Division of Environmental Health

Any project which is expected to become a source or indirect source of air pollution (e.g., hydrocarbons) shall submit to the Executive Secretary a Notice of Intent prior to initiation of construction, modification, or relocation, as per Part III of the Utah Air Conservation Regulations.

Utah State Division of Water Rights

Temporary water rights and permits to appropriate Utah surface waters for use during construction (e.g., hydrostatic test water) must be obtained from the Utah State Division of Water Rights.

Wyoming State Board of Land Commissioners

The state has permitting authority over the state lands regarding rights-of-way or other uses of property or resources on state lands. The jurisdiction includes permitting authority involving new construction of power lines, pump stations, pipelines, access roads, etc. The applicant would be required to obtain these land use permits for an easement across all state lands affected by the proposed pipeline.

Wyoming State Engineer

Temporary water rights and permits to appropriate Wyoming surface waters for use during construction (e.g., hydrostatic test water) must be obtained from the State Engineer. These permits require information on the location, use, and quantity of the diversion.

Wyoming Department of Environmental Quality (DEQ)

Any project that may cause emission of air pollutants (e.g., hydrocarbons) in Wyoming must obtain Air Quality Permits to Construct and Operate, as per Section 21 of the DEQ, Wyoming Air Quality Standards and Regulations. The applicant is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the DEQ for hydrostatic test water discharges in Wyoming.

Wyoming Highway Department

Permission to cross highways is needed from the Wyoming Highway Department.

State Historic Preservation Officer

Under Executive Order 11593 (Protection and Enhancement of the Cultural Environment) and the Historic Preservation Act of 1966 (as amended), Section 106, in accordance with 36 CFR 800 (Protection of Historic and Cultural Properties) the State Historic Preservation Officer must be consulted regarding this proposal.

OTHER JURISDICTIONS

Easements and permits from regional and local jurisdictions would be identified and obtained by the applicant from the relevant jurisdiction as applicable. Permission to cross county roads or private rights-of-way would be obtained from the relevant county commissioners or appropriate owner.

1.5 SUMMARY OF SIGNIFICANT IMPACTS

Summary findings from the various impact assessments are presented in Table 1-5. The summary of findings should be interpreted in conjunction with the descriptions of impacts in the text of Chapter Three of the DEIS or technical reports. The keyed symbols in Table 1-5 are merely a guide to what is described in the texts. Indicated significant impacts may refer to only one specific location along the entire proposed or alternative pipeline routes, and may also be very short-term in nature (e.g., would only occur during construction period). Criteria used to determine impact significance are contained in Appendix A. Documentation of findings of "no impact" or "no significant impact" are contained in the technical reports or Appendix D.

1.6 STATEMENT OF AGENCIES' PREFERRED ALTERNATIVES

In identifying preferred alternatives, the BLM considered the relative environmental effects of the alternatives and the corresponding portions of the proposed route.

The four routings considered between MP 214.75 and MP 259.1 represent different methods of traversing an area commonly known as the Sweetwater Rocks. The Sweetwater Rocks and surrounding area is a unique landform that is further enhanced by its limited access and a resultant minimal amount of human activity. This results in an area that affords a rare opportunity for solitude and appreciation of visual values. The potential environmental impacts of the four routings are, overall, generally similar; and all four routings will be further considered throughout the decision making process. At the present time, the County Line Alternative is preferred because it is the only alternative that does not pass directly through the Sweetwater Rocks area.

Table 1-5. SUMMARY OF IMPACTS FOR PROPOSED ACTION AND ALTERNATIVES[a]

	MP -1.2-214.75	MP 214.75-259.1				MP 259.1-267.75	MP 267.75-281		MP 281-287
Impact Topics[b,c]	Proposed Route	Proposed Route	Beef Gap Alternative	Beulah Belle Lake Alternative	County Line Alternative	Proposed Route	Proposed Route	Emigrant Gap Alternative	Proposed Route
Pipeline Miles	215.95	44.35	44.5	47.4	47.75	8.65	13.25	13.75	6
Construction Acreage[d]	2,617	538	539	575	579	105	161	167	73
Wildlife	(-)	NS	NS	NS	NS	NS	NS	NS	NS
Threatened and Endangered Species[e]	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)
Paleontology	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)
Social and Economic Conditions	CUM	NS	NS	NS	NS	NS	NS	NS	NS
Visual Resources	(-)	(-)	NS	NS	NS	NS	NS	NS	NS
Cultural Resources[f]	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)
Spill Effects	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)

Key: (-) = significant adverse impact; NS = no significant impact; (?) = unknown significance; and CUM = significant impact due to cumulative effects of simultaneous developments. Impact findings were based on the assumption that the Applicant Mitigation measures in Chapter One would be implemented. Refer to Chapter Three of the DEIS or technical reports for descriptions of impacts.

[a] Indicated significant impacts may refer to only one specific location along the entire proposed or alternative pipeline routes, and may also be very short-term in nature (e.g., would only occur during construction period).

[b] Findings of "no impact" or "no significant impact" for the proposed action and alternatives were identified for the following impact topics: Climate, Air Quality, Noise, Geology (geologic hazards), Mineral Resources, Vegetation, Livestock Grazing, Aquatic Biology, Wild Horses, Soils, Agriculture (cropland), Prime and Unique Farmlands, Water Resources (including 100-Year Floodplains), Transportation Network, Recreation Resources, and Wilderness Values. Refer to Appendix A for the criteria used to determine impact significance. Documentation of findings of "no impact" or "no significant impact" is contained in the technical reports or Appendix D.

[c] The proposed action or alternatives would result in a beneficial impact to Energy Use during the operational phase of the project.

[d] Construction acreage is based on a 100-foot-wide construction ROW, and does not include staging/work areas, transmission lines, or other ancillary facilities.

[e] The unknown significance listed under Threatened and Endangered Species refers only to the Biological Assessment finding of "may affect" for the black-footed ferret. The Biological Assessment finding was "no effect" for the bald eagle, American peregrine falcon, and the whooping crane.

[f] Impacts were assessed for significance in terms of applicant mitigation measures and BLM compliance stipulations. As a result of the Class I overview and the Class III field survey, it is assumed that all of the known or newly discovered sites would be avoided or mitigated by the applicant. However, the potential for discovering an unknown subsurface site during construction does exist, thus impact significance for cultural resources is summarized as unknown.

The two routings from MP 267.75 to MP 281 represent two different ways of approaching Casper from the southwest. The Emigrant Gap Alternative is preferred because it lies within an existing utility corridor that was identified, with public input, during the development of the existing Natrona County Management Framework Plan, and approximately 78 percent of it parallels existing utilities or roads, versus about 23 percent for the corresponding portion of the proposed route. Additionally, the Emigrant Gap Alternative completely avoids the important eagle winter concentration area along the North Platte River which is traversed by the proposed route.

1.7 BLM MITIGATION MEASURES

Based on BLM resource management planning documents and field examinations, the BLM will stipulate in the Operating Plan specific dates during which construction would be avoided due to crucial wildlife use in certain areas (Table 1-6 generally indicates these locations and dates). These are periods during which crucial wildlife use would be expected according to existing data from BLM or state documents, or consultations with the area biologists. Construction would not occur during these periods unless specifically authorized by the Authorized Officer.

The BLM and the applicant will develop an Operating Plan and stipulations to mitigate adverse impacts identified in the EIS. This Operating Plan and the stipulations would be a condition of the Grant of ROW.

Table 1-6. CRUCIAL WILDLIFE USE AREAS AND PERIODS TO AVOID DURING CONSTRUCTION OF THE PROPOSED ACTION OR ALTERNATIVES

Milepost	Crucial Wildlife Use Areas	Dates During Which Construction Would Be Avoided[a]
Proposed Route		
1.0 - 4.5	Mule deer crucial winter/ yearlong range	December 15-April 1[b]
8.5 - 14.0	Mule deer crucial winter/ yearlong range	December 15-April 1[b]
38.0	Sage grouse strutting ground	March 1-June 15[b]
56.0 - 59.5	Pronghorn crucial winter/ yearlong range	December 15-April 1[b]
69.5 - 73.0	Pronghorn crucial winter/ yearlong range	December 15-April 1[b]
73.0 - 74.0	Pronghorn crucial winter range	December 15-April 1[b]
74.0 - 79.0	Pronghorn crucial winter/ yearlong range	December 15-April 1[b]
79.0 - 87.5	Pronghorn crucial winter range	December 15-April 1[b]
83.0	Sage grouse strutting ground	March 1-June 15[b]
83.5	Sage grouse strutting ground	March 1-June 15[b]
87.0	Golden eagle nest	March 1-June 30[b]
89.0 - 93.0	Pronghorn crucial winter range	December 15-April 1[b]
102.0	Golden eagle nest	March 1-June 30[b]
112.5	Golden eagle nest	March 1-June 30[b]
111.5 - 118.5	Pronghorn crucial winter range	December 15-April 1[b]
119.0	Sage grouse strutting ground	March 1-June 15[b]
119.5	Prairie falcon nest	March 1-June 30[b]
120.5 - 121.5	Mule deer crucial winter range	December 15-April 1[b]
123.5 - 125.0	Mule deer crucial winter range	December 15-April 1[b]
155.5	Sage grouse strutting ground	No occupancy or other surface disturbance (all year)[c]
174.5	Sage grouse strutting ground	No occupancy or other surface disturbance (all year)[c]
191.0	Sage grouse strutting ground	March 1-June 15[c]
192.0	Sage grouse strutting ground	March 1-June 15[c]
211.0 - 228.0	Pronghorn crucial winter/ yearlong range	December 15-April 1[c]
245.5 - 253.0	Pronghorn crucial winter range	December 15-April 1[c]
254.5	Sage grouse strutting ground	March 1-June 15[d]
256.0	Sage grouse strutting ground	March 1-June 15[d]
259.5	Sage grouse strutting ground	March 1-June 15[d]
260.5	Sage grouse strutting ground	March 1-June 15[d]
273.0 - 277.0	Bald eagle winter concentration area	November 1-March 31[d]

Table 1-6. CRUCIAL WILDLIFE USE AREAS AND PERIODS TO AVOID DURING CONSTRUCTION OF THE PROPOSED ACTION OR ALTERNATIVES (concluded)

Milepost	Crucial Wildlife Use Areas	Dates During Which Construction Would Be Avoided[a]
Beef Gap Alternative		
0.0 - 2.5	Pronghorn crucial winter/ yearlong range	December 15-April 1[c]
30.0 - 37.5	Pronghorn crucial winter range	December 15-April 1[c]
44.5	Sage grouse strutting ground	March 1-June 15[c]
Beulah Belle Lake Alternative		
0.0 - 3.5	Pronghorn crucial winter/ yearlong range	December 15-April 1[c]
22.5 - 26.0	Pronghorn crucial winter range	December 15-April 1[c]
29.5 - 40.0	Pronghorn crucial winter range	December 15-April 1[c]
42.0	Sage grouse strutting ground	March 1-June 15[c]
43.5	Sage grouse strutting ground	No occupancy or other surface disturbance (all year)[c]
47.0	Sage grouse strutting ground	No occupancy or other surface disturbance (all year)[c]
County Line Alternative		
0.0 - 15.5	Pronghorn crucial winter/ yearlong range	December 15-April 1[c]
19.0 - 27.0	Pronghorn crucial winter range	December 15-April 1[c]
30.0 - 40.5	Pronghorn crucial winter range	December 15-April 1[c]
42.5	Sage grouse strutting ground	March 1-June 15[c]
44.0	Sage grouse strutting ground	No occupancy or other surface disturbance (all year)[c]
47.5	Sage grouse strutting ground	March 1-June 15[c]
Emigrant Gap Alternative		
3.0	Sage grouse strutting ground	March 1-June 15[d]

Note: The distance criteria for inclusion of sage grouse strutting grounds and raptor nests in this table are: sage grouse strutting grounds within 2 miles of route; and golden eagle, and prairie falcon nests within 0.5 miles of route.

[a] Unless authorized by appropriate Area Manager.
[b] Stipulation determined by BLM-Rock Springs District.
[c] Stipulation determined by BLM-Rawlins District.
[d] Stipulation determined by BLM-Casper District.

CHAPTER TWO
AFFECTED ENVIRONMENT

Impacts from the proposed action and alternatives were analyzed for all of the following resources:

- Land Use Controls and Constraints
- Climate
- Air Quality
- Noise
- Geology (geologic hazards)
- Mineral Resources
- Vegetation
- Livestock Grazing
- Aquatic Biology
- Wildlife
- Paleontology
- Soils
- Agriculture
- Water Resources
- Social and Economic Conditions
- Transportation Network
- Recreation
- Wilderness Values
- Visual Resources
- Cultural Resources

In addition to these, several special topics are addressed in accordance with specific guidance or regulations. These are: Prime and Unique Farmlands; 100-year Floodplains; Threatened and Endangered Species; Wild Horses; and Energy Use.

Criteria by which significant impacts were determined are presented for each resource in Appendix A (Frameworks for Analysis). In accordance with guidance provided in Appendix A, the analyses were conducted and are documented in technical reports. These are on file at the following BLM District Offices: Rawlins, Rock Springs, and Casper. Documentation of the analyses conducted for the 1.2-mile pipeline extension and Originating pump station are contained in Appendix D or in the technical reports (Oil Spill Analysis and Energy Use).

Technical reports are available for the following resources:

- Climate, Air Quality and Noise
- Geologic Hazards
- Mineral Resources
- Vegetation
- Livestock Grazing
- Aquatic Biology
- Wildlife
- Paleontology
- Soils and Prime Farmland
- Water Resources
- Oil Spill Analysis
- Social and Economic Conditions
- Recreation
- Wilderness Values
- Visual Resources
- Energy Use

2.1 LAND USE CONTROLS AND CONSTRAINTS

The proposed route would traverse 151 miles of federal lands under the jurisdiction of the BLM. Management Framework Plans (MFPs) exist for all of the potentially affected BLM Planning Units. These MFPs include guidelines regarding use of utility corridors. Portions of the proposed route do not conform to the presently identified utility corridors in the applicable MFPs covering the Rock Springs, Rawlins, and Casper Districts. The Emigrant Gap Alternative conforms to the MFP for the Casper District. Additionally, the eastern ends of the Beulah Belle Lake and County Line alternatives generally conform to the Casper District MFP. Although portions of the proposed action and alternatives are not specifically addressed in the applicable MFPs, the BLM is currently considering establishing new utility corridors in areas where utility corridors were not previously anticipated. The analysis in this EIS will be used by the BLM as a basis for consideration of granting a pipeline ROW outside of presently existing utility corridors.

No designated Areas of Critical Environmental Concern (ACEC) would be affected by the proposed action or alternatives, although the proposed route comes within 1.75 miles of Jackson Canyon ACEC in Natrona County, and within 1.0 mile of the Greater Sand Dunes ACEC in Sweetwater County.

Most of the potentially affected land is covered by county comprehensive plans, which specify permitted land uses. In areas where pipeline activity is not specified as a permitted land use, the proposed action or alternatives could be accommodated through application to county authorities for special use permits, conditional use permits, or temporary use permits.

2.2 PROPOSED ACTION AND ALTERNATIVES

Baseline data is presented in this chapter for all the resources and special topics listed in the beginning of this chapter, except climate, air quality, noise, geologic hazards, mineral resources, transportation network, and energy use, which where found to not be significantly impacted by the proposed action or alternatives. Refer to Chapter One for the geologic hazards discussion and to Chapter Three (Section 3.3) for the energy use analysis. Documentation for the findings of no significant impact for climate, air quality, and noise; mineral resources; and transportation network is contained in the technical reports (refer to the Social and Economic Conditions Technical Report for transportation network).

VEGETATION

The vegetation of the potentially affected area for the proposed and alternative routes can be divided into eight major vegetation types: sagebrush-grass, saltbush-greasewood, sand dune forb-grass, cropland, grass-forb, sagebrush-grass/conifer woodland, juniper woodland, and riparian. A detailed description of these types is presented in the Vegetation Technical Report.

The total distance of each major vegetation type (excluding riparian) crossed by the proposed and alternative routes is presented in Table 2-1. Individual segments of each major type (excluding riparian) crossed by the proposed and alternative routes are presented in Table 2-2. Areas of the riparian vegetation type crossed by the proposed and alternative routes are presented in Table 2-3.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service has stated that no listed or proposed federal threatened or endangered plant species are distributed in the potentially affected area of the project (Crete, 1982).

Table 2-1. TOTAL DISTANCES OF MAJOR VEGETATION TYPES CROSSED BY THE PROPOSED AND ALTERNATIVE ROUTES

Route	Vegetation Type	Distance (miles)	Percent Total
Proposed Route	sagebrush-grass	215	75
	saltbush-greasewood	25	9
	sand dune forb-grass	14	5
	cropland	13	5
	grass-forb	9	3
	sagebrush-grass/conifer woodland	6	2
	juniper woodland	5	2
	Total	287	
Beef Gap Alternative	sagebrush-grass	40.5	91
	sand dune forb-grass	4	9
	Total	44.5	
Beulah Belle Lake Alternative	sagebrush-grass	46.4	98
	sand dune forb-grass	1	2
	Total	47.4	
County Line Alternative	sagebrush-grass	47.75	100
Emigrant Gap Alternative	sagebrush-grass	7	51
	cropland	4.75	35
	grass-forb	2	15
	Total	13.75	

Table 2-2. INDIVIDUAL SEGMENTS OF MAJOR VEGETATION TYPES CROSSED BY THE PROPOSED AND ALTERNATIVE ROUTES

Route	Milepost	Distance (miles)	Vegetation Type
Proposed Route	0-12	12	sagebrush-grass
	12-14	2	cropland
	14-38	24	sagebrush-grass
	38-46	8	sand dune forb-grass
	46-50	4	cropland
	50-57	7	sagebrush-grass
	57-58	1	sand dune forb-grass
	58-85[a]	27	sagebrush-grass
	85-91	6	saltbush-greasewood
	91-94	3	sagebrush-grass
	94-99	5	saltbush-greasewood
	99-111	12	sagebrush-grass
	111-118	7	saltbush-greasewood
	118-156[b]	38	sagebrush-grass
	156-160	4	saltbush-greasewood
	160-165	5	juniper woodland
	165-168	3	saltbush-greasewood
	168-198[c]	30	sagebrush-grass
	198-204	6	sagebrush-grass conifer woodland
	204-231	27	sagebrush-grass
	231-233	2	sand dune forb-grass
	233-241	8	sagebrush-grass
	241-244	3	sand dune forb-grass
	244-262	18	sagebrush-grass
	262-271	9	grass-forb
	271-274	3	cropland
	274-281	7	sagebrush-grass
	281-285	4	cropland
	285-287	2	sagebrush-grass
Beef Gap Alternative	0-9	9	sagebrush-grass
	9-10	1	sand dune forb-grass
	10-28	18	sagebrush-grass
	28-31	3	sand dune forb-grass
	31-44.5	13.5	sagebrush-grass

2-2. INDIVIDUAL SEGMENTS OF MAJOR VEGETATION TYPES CROSSED BY THE PROPOSED AND ALTERNATIVE ROUTES (concluded)

Route	Milepost	Distance (miles)	Vegetation Type
Beulah Belle Lake Alternative	0-10	10	sagebrush-grass
	10-11	1	sand dune forb-grass
	11-47.4	36.4	sagebrush-grass
County Line Alternative	0-47.5	47.75	sagebrush-grass
Emigrant Gap Alternative	0-2	2	grass-forb
	2-4	2	sagebrush-grass
	4-7	3	cropland
	7-12	5	sagebrush-grass
	12-13.75	1.75	cropland

Sources: 1) Wyoming Cooperative Fishing and Wildlife Research Unit (1981) (1:500,000 scale map)
2) Bureau of Land Management, Unit Resource Analyses for Planning Units (maps)

[a] Includes 1/4 Point pump station.

[b] Includes Midpoint pump station.

[c] Includes 3/4 Point pump station.

Table 2-3. RIPARIAN HABITATS CROSSED BY THE PROPOSED AND ALTERNATIVE ROUTES

Route	Milepost	Stream, River, or Canal[a]	Flow Type[b]	Physical Characteristics	Riparian Vegetation Subtype
Proposed Route	8	Coyote Creek	P	shallow slopes	willow-wet meadow
	12	Bear River	P	shallow slopes	cottonwood-willow-wet meadow
	28	Antelope Creek	P	steep slopes	willow-wet meadow
	29	Muddy Creek	P	shallow slopes	willow-wet meadow
	43	Austin Canal	P	steep slopes	willow-wet meadow
	47	Austin Canal	P	steep slopes	willow-wet meadow
	57	Blacks Fork	P	shallow slopes	cottonwood-willow-wet meadow
	78	Blacks Fork	P	shallow slopes	cottonwood-willow-wet meadow
	86	Green River	P	shallow slopes	cottonwood-willow-wet meadow
	184	Arapahoe Creek	I	shallow slopes	willow-wet meadow
	187	Arapahoe Creek	I	shallow slopes	willow-wet meadow
	190	Arapahoe Creek	I	shallow slopes	willow-wet meadow
	195	Crooks Creek	P	shallow slopes	willow-wet meadow
	200	Sheep Creek	I	steep slopes	willow-wet meadow
	204	West Cottonwood Creek	I	steep slopes	cottonwood-willow-wet meadow
	207	UT Cottonwood Ceek	I	steep slopes	willow-wet meadow
	209	East Cottonwood Creek	I	steep slopes	cottonwood-willow-wet meadow
	223	Sweetwater River	P	shallow slopes	willow-wet meadow
	237	Dry Creek	P	shallow slopes	willow-wet meadow
	249	Horse Creek	P	shallow slopes	willow-wet meadow
	274	Poison Spider Creek	P	shallow slopes	willow-wet meadow
	285	Casper Creek	P	shallow slopes	wet meadow
Beef Gap Alternative	3	Sweetwater River	P	shallow slopes	willow-wet meadow
	20	Dry Creek	P	shallow slopes	willow-wet meadow
	32	UT Horse Creek	P	shallow slopes	willow-wet meadow
Beulah Belle Lake Alternative	5	Sweetwater River	P	shallow slopes	willow-wet meadow
	23	Dry Creek	P	shallow slopes	willow-wet meadow
	33	Horse Creek	P	shallow slopes	willow-wet meadow
	37	Fish Creek	P	shallow slopes	willow-wet meadow
	40	Shell Creek	P	shallow slopes	willow-wet meadow
County Line Alternative	8	Muddy Creek	P	shallow slopes	willow-wet meadow
	13	Cherry Creek	P	shallow slopes	willow-wet meadow
	23	Sweetwater River	P	shallow slopes	willow-wet meadow
	27	Dry Creek	P	shallow slopes	willow-wet meadow
	34	Horse Creek	P	shallow slopes	willow-wet meadow
	37	Fish Creek	P	shallow slopes	willow-wet meadow
	40	Shell Creek	p	shallow slopes	willow-wet meadow

Table 2-3. RIPARIAN HABITATS CROSSED BY PROPOSED AND ALTERNATIVE ROUTES (concluded)

Route	Milepost	Stream, River, or Canal[a]	Flow Type[b]	Physical Characteristics	Riparian Vegetation Subtype
Emigrant Gap Alternative	6.3	Poison Spider Creek	P	shallow slopes	willow-wet meadow
	6.9	Unnamed stream	P	shallow slopes	willow-wet meadow
	7.7	UT Casper Canal	P	shallow slopes	willow-wet meadow
	10.5	UT Casper Canal	P	shallow slopes	willow-wet meadow
	10.6	Unnamed stream	P	shallow slopes	willow-wet meadow
	13.1	UT North Platte River	P	shallow slopes	willow-wet meadow

Source: Bureau of Land Management, Unit Resource
Analyses for Planning Units (maps)

[a] UT = unnamed tributary.

[b] P = perennial; I = intermittent (determined from U.S.G.S. topographic maps [1:250,000]).

LIVESTOCK GRAZING

Rangeland that would be disturbed by the proposed action or alternatives has a livestock grazing capacity ranging from 11 to 56 acres per animal-unit-month (AUM), averaged for cattle and sheep (USDI 1978).

AUMs corresponding to the major vegetation types described in the Vegetation Technical Report were used as the unit of measure. The Livestock Grazing Technical Report lists the acreage requirements per AUM for each major vegetation type.

Proposed Route

Grazing capacity averages 17 acres per AUM for cattle and sheep over the entire length of the proposed route. The 100-foot-wide construction ROW associated with the proposed route contains approximately 211 AUMs. The pump station locations contain less than 1 AUM total.

Beef Gap Alternative

Grazing capacity averages about 16 acres per AUM over the length of this alternative, and the construction ROW associated with this alternative contains approximately 34 AUMs.

Beulah Belle Lake Alternative

Grazing capacity averages about 15 acres per AUM over the length of this alternative, and the construction ROW associated with this alternative contains approximately 38 AUMs.

County Line Alternative

Grazing capacity averages about 15 acres per AUM over the length of this alternative, and the construction ROW associated with this alternative contains approximately 39 AUMs.

Emigrant Gap Alternative

Grazing capacity averages about 21 acres per AUM over the length of this alternative, and the construction ROW associated with this alternative contains approximately 8 AUMs.

AQUATIC BIOLOGY

The U.S. Fish and Wildlife Service and Wyoming Game and Fish Department (1978) have evaluated the fishery resources of many Wyoming streams and rivers. These agencies have classified waterbodies with known fisheries resources in accordance with the following value class criteria:

Value Class	Criteria
1	highest valued fishery resource
2	high-priority fishery resource
3	substantial fishery resource
4	limited fishery resource

Wyoming streams which have not been classified include intermittent drainages as well as streams which have not been surveyed. All stream classifications pertinent to the proposed action and alternatives are based upon the presence of species of "high interest" to the state of Wyoming. Specifically, potentially affected classified streams generally contain one or more species of salmonids. In drainages where a macroinvertebrate fauna (e.g., aquatic insects) exists, flies, beetles, mayflies, caddisflies, and stoneflies are normally the dominant species.

Issues relevant to this assessment are discussed in the Framework for Analysis (see Appendix A). Documentation of the detailed analysis of potential impacts to aquatic biological resources is contained in the Aquatic Biology Technical Report.

Proposed Route

The proposed route would cross 104 intermittent/ephemeral and 17 perennial streams contained within the Bear River, Green River (Wyoming), and North Platte river basins. Classified streams and/or streams with known salmonid populations crossed by the proposed route are identified in Table 2-4. Sixteen classified (Value Class 1-4) streams are crossed by the proposed route.

Beef Gap Alternative

The Beef Gap Alternative would traverse 14 streams, 11 of which are intermittent. Three have been given Class 4 fishery resource classification and one has received a Class 3 designation (USFWS and WGF 1978).

Beulah Belle Lake Alternative

The Beulah Belle Lake Alternative would cross seven intermittent and five perennial streams, three of which have been classified Class 4 and one has been classified Class 3 (USFWS and WGF 1978).

County Line Alternative

The County Line Alternative would cross 26 streams, seven of which are perrenial. Six streams have been designated Class 4 and one stream has been designated Class 3 (USFWS and WGF 1978).

Emigrant Gap Alternative

The Emigrant Gap Alternative would cross two intermittent and six perennial streams, none of which has been classified (USFWS and WGF 1978).

Table 2-4. CLASSIFIED AND UNCLASSIFIED STREAMS CONTAINING SALMONID POPULATIONS THAT WOULD BE CROSSED BY THE PROPOSED ACTION AND ALTERNATIVES

Pipeline Route[a]	Stream	MP[b]	Classification and/or Salmonid Species Present
Proposed Route	Yellow Creek	2	4
	Bear River	12	2 mountain whitefish, cutthroat, brown
	Black Fork	57/78	3 cutthroat, rainbow, brown, brook
	Green River	86	1 kokanee, rainbow, brown, lake
	Crooks Creek	195	3 brook
	UT Crooks Creek	197	4
	Sheep Creek	200	brook,
	Cottonwood Creek drainage	202-209	3,4 brook
	Cooper Creek	211	4 cutthroat
	Willow Creek	218	3
	Sweetwater River	223	4 rainbow, brown, brook
	Dry Creek	237	4
	Horse Creek	248	4 cutthroat, rainbow, brown
	Shell Creek	254	4
	Willow Creek	260	brook
	Casper Creek	285	4 rainbow
Beulah Belle Lake Alternative	Sweetwater River	5	3 rainbow, brown, brook
	Dry Creek	23	4
	Horse Creek	33	4 cutthroat, rainbow, brown
	Shell Creek	40	4
Beef Gap Alternative	Sweetwater River	3	3 rainbow, brown, brook
	Dry Creek	20	4
	Horse Creek	32	4 cutthroat, rainbow, brown
	Shell Creek	38	4
County Line Alternative	Willow Creek	2	3 brook
	Cherry Creek	13	4
	Pete Creek	16	4
	Sweetwater River	23	4 rainbow, brown, brook
	Dry Creek	27	4
	Horse Creek	34	4 cutthroat, rainbow, brown
	Shell Creek	40	4

Sources:
1) Wyoming Game and Fish Department (undated)
2) Bureau of Land Management (1982)
3) USFWS and WGF (1978)
4) USGS Topographic Maps (1:250,000 scale)

[a] The Emigrant Gap Alternative does not cross any streams which are classified and/or contain salmonid species.

[b] MP = approximate milepost at crossing

Threatened and Endangered Species

There are no known populations of state or federal endangered or threatened aquatic species in any aquatic habitats potentially affected by the proposed action or alternatives (USFWS 1982, Clark and Dorn 1981).

WILDLIFE

The fauna of the total potentially affected area for the proposed and alternative routes is comprised of approximately 54 regularly occurring mammal species (Long 1965, Findholt et al. 1981), 195 bird species (Oakleaf et al. 1979), eight reptile species, and seven amphibian species (Baxter and Stone 1980). The total mammal fauna is comprised of three shrew species, one bat, four rabbits or hares, ten squirrels, two pocket gophers, ten mice, beaver, muskrat, porcupine, three canids (dogs), black bear, raccoon, seven mustelids (weasels), two felids (cats), elk, mule deer, white-tailed deer, moose, pronghorn, bighorn and wild horses. The total avifauna is primarily comprised of grebes, double-crested cormorant, herons, Canada goose, cranes, rails, ducks, hawks, eagles, falcons, grouse, shorebirds, gulls, doves, owls, goatsuckers, hummingbirds, woodpeckers, flycatchers, swallows, and passerines (songbirds). The total herpetofauna (reptiles and amphibians) is comprised of one salamander, six toads or frogs, one turtle, two lizards, and five snakes.

Major vegetation habitat types of the total potentially affected area for the proposed and alternative routes are sagebrush-grass, saltbush-greasewood, sand dune forb-grass, cropland, grass-forb, sagebrush-grass/conifer woodland, juniper woodland, and riparian. The Vegetation Technical Report summarizes important ecological characteristics of these vegetation habitat types and summarizes their geographic distribution along the proposed and alternative routes.

Important non-vegetation habitat types include cliffs and rock outcroppings, and rivers, streams, and lakes.

Table 2-5 summarizes the occurrence and distribution of important wildlife resources (big game species, sage grouse, and raptors) along the proposed and alternative routes. The Wildlife Technical Report presents more detailed information.

The proposed route also crosses elk winter range (not crucial) between MPs 90-100 and 125-140 in the Red Desert area. Approximately 55 animals use the area between MPs 90-100. This area includes a ridge and adjacent Alkali Creek Canyon. The area between MPs 125-140 is an area of stabilized sand dunes. Wintering elk in this area occur behind sand dunes to avoid strong winds and browse on exposed bitterbrush plants. An area between MPs 110-111 on the proposed route is occasionally used in the spring as a calving area. This area is on White Mountain.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS), Office of Endangered Species (OES), has indicated that four listed endangered animal species-- the black-footed ferret, bald eagle, American peregrine falcon, and whooping crane--potentially, or are confirmed to, occur in the affected area for the project and they were all considered in the Biological Assessment. The Biological Assessment has been prepared and has been submitted to USFWS. On the basis of the Biological Assessment, the USFWS will formulate the Biological Opinion which will present their conclusions about potential adverse impacts of project implementation on these species.

Table 2-5. SUMMARY OF WILDLIFE RESOURCES

	Important Wildlife Habitat							
	Pronghorn		Mule Deer		Sage Grouse		Raptors	
Route	Crucial Winter Range (miles)	Crucial Winter/ Yearlong Range (miles)	Crucial Winter Range (miles)	Crucial Winter/ Yearlong Range (miles)	Strutting Grounds (number)[a]	Wintering Areas (miles)	Nests (numbers)[b]	Bald Eagle Winter Concentration Area (miles)
Proposed Route	28.0 (5 areas)	29 (4 areas)	2.5 (2 areas)	9 (2 areas)	12	5.5 (3 areas)	1 Golden eagle 1 Great horned owl 1 Prairie falcon	4 (1 area)
Beef Gap Alternative	7.5 (1 area)	2.5 (1 area)	—	—	1	—	1 Great horned owl	—
Beulah Belle Lake Alternative	14 (2 areas)	3.5 (1 area)	—	—	3	—	1 Swainson's hawk 1 Great horned owl	—
County Line Alternative	18.5 (2 areas)	15.5 (1 area)	—	—	3	—	1 Swainson's hawk 1 Great horned owl	—
Emigrant Gap Alternative	—	—	—	—	1	—	—	—

[a] Within 2 miles of pipeline route.

[b] Within 0.5 mile of pipeline route.

WILD HORSES

Wild horses occur along the proposed route between mileposts 90 and 210. A total of 2141 individuals in 82 herds were recorded in this area during censuses conducted by the BLM in the fall, winter, and spring of 1981 and 1982. Wild horses occur in a wide variety of shrub-grass and other types of habitat in this area. This species is herbivorous, and feeds on grasses and grass-like species in all habitats in which it occurs (Zarn et al. 1977).

There are no wild horse concentrations near any of the alternative routes.

PALEONTOLOGY

The proposed and alternative routes cross six major structural and topographic units in southwest and southcentral Wyoming. Geological formations in these areas reflect past environments: in the uplift areas are marine sediments that were deposited in an extensive inland sea that occupied the area more than 65 million years ago; in the intermontane basins are thick sequences of laucustrine and fluvial (lake and riverine) sediments that accumulated from the erosion of the surrounding mountains. Geologic formations in the region contain the fossil remains of the animals and plants that once occupied these ancient environments.

Assessment of the paleontological resources of the study area is based on the scientific or educational significance of the fossils, and the sensitivity of the area to project-related disturbance. Geologic formations within the study area were assigned a sensitivity rating, based on a classification scheme in which consideration was given to factors that include the significance of the fossils, their condition, and their abundance within the area. Table 2-6 lists total miles of areas that may contain potentially significant fossils for the proposed and alternative routes.

The number of identified (literature search only) significant fossil localities which are either traversed (including those within 200 feet) or within 1 mile of the proposed and alternative routes is presented below. Refer to the Paleontology Technical Report for more specific information (e.g., fossil types, site occurrence number, general location of sites).

Proposed Route

The proposed route traverses six identified fossil localities, and comes within 1 mile of an additional 14 identified fossil localities.

Beef Gap Alternative

This alternative route traverses one identified fossil locality, and comes within 1 mile of one additional identified fossil locality.

Beulah Belle Lake Alternative

The Beulah Belle Lake Alternative does not traverse any identified fossil localities, but does come within 1 mile of two known fossil localities.

County Line Alternative

This alternative route does not traverse any identified fossil localities, but does come within 1 mile of two identified fossil localities.

Emigrant Gap Alternative

The Emigrant Gap Alternative does not traverse or come within 1 mile of any identified fossil localities.

Table 2-6. PALEONTOLOGICAL SENSITIVITY OF AREAS CROSSED BY THE PROPOSED AND ALTERNATIVE ROUTES

Route	Sensitivity		
	Low	Moderate	High
Proposed Route	MP 120 - 135 MP 195 - 202 MP 265 - 277 MP 279 - 287	MP 258 - 265 MP 277 - 279	MP 0 - 120 MP 135 - 195 MP 202 - 258
Beef Gap Alternative			MP 0 - 44.5
Beulah Belle Lake Alternative			MP 0 - 47.4
County Line Alternative			MP 0 - 47.75
Emigrant Gap Alternative	MP 0 - 8 MP 12 - 13.75	MP 8 - 12	

Approximately 119 miles of the proposed route were identified to be of high paleontological sensitivity. A field inventory of these high sensitivity areas was conducted by Powers Elevation Company, to further define and locate specific fossil localities potentially affected by pipeline construction. This inventory resulted in the location of 5 fossil localities, which are on or adjacent to the proposed pipeline corridor. Refer to the Paleontology Technical Report (Appendix C) for more specific information (e.g., fossil types, location, etc.).

SOILS AND AGRICULTURE

Proposed Route

Areas of soils with relatively low reclamation potential include an area of sand dunes crossed by the proposed route about 12 miles north of Superior in Sweetwater County (MP 131.25 to 135.25); large intermittently occurring areas of sandy soils susceptible to wind erosion; highly saline-alkaline areas of playas, drainages, and alluvial fans throughout the five-county area (e.g., MP 149.4 to 150.4); and very steeply sloping land surfaces (White Mountain, MP 111.75 to 112.4, and Green Mountain areas, MP 198 to 201.5 [Larsen, 1982; Larsen and Stephens, 1975; U.S. Department of Agriculture 1978a, 1978b, 1981a, 1981b; U.S. Department of the Interior, 1981, 1982, Undated, a; Wells and Knox, 1981]). Additional areas of soils with low reclamation potential (e.g., saline-alkaline, sandy, and shallow soils) are present along the proposed route, but were not specifically identified due to the complexity of their occurrence on the landscape. Areas of low soil reclamation potential can be generally inferred from the existing vegetation. For example, saltbrush-greasewood vegetation type areas are often difficult to reclaim due to excess alkalinity/clays, and sand dune forb-grass areas are often difficult to reclaim due to their susceptibility to wind erosion. Refer to Table 2-2 for mileposted areas of the aforementioned vegetation types, which are indicative of low soil reclamation potential.

Nearly all of the potentially affected area is used as rangeland. Agricultural areas which would be affected by the proposed route include small acreages of native hayland in the Bear River Valley in Uinta County (MP 12 to 13.5); and irrigated haylands/croplands west of Casper in Natrona County (MP 268.3 to 268.8, 270.5 to 273.5, and 280.5 to 283.5 [U.S. Department of Agriculture, 1970, 1974]).

Beef Gap Alternative

Important areas of soils with relatively low reclamation potential include saline-alkaline areas in and near drainages and sandy soils occurring intermittently along this alternative route in Natrona County.

Beulah Belle Lake Alternative

Important areas of soils with relatively low reclamation potential include saline-alkaline areas in and near drainages and sandy soils occurring intermittently along this alternative route in Natrona County.

County Line Alternative

Important areas of soils with relatively low reclamation potential include saline-alkaline areas of drainages and alluvial fans occurring intermittently along this alternative route in Natrona and Carbon counties.

Emigrant Gap Alternative

Important areas of soils with relatively low reclamation potential include saline-alkaline areas in and near drainages occurring intermittently along this alternative route in Natrona County. Several areas of irrigated haylands/croplands are present along this alternative west of Casper (MP 4 to 8 and 11 to 13.75).

PRIME FARMLAND

None of the areas that would be affected by the proposed action or alternatives qualify as Prime or Unique Farmland (Iiames, 1982; Lewis, 1982; Melnor, 1982; Ravenholt, 1982; Suhr, 1982; U.S. Department of Agriculture, 1980).

WATER RESOURCES

The proposed and alternative routes would cross numerous washes, creeks, streams, and rivers, including both perennial and intermittent watercourses. The names and locations of the larger perennial streams and rivers (i.e., generally those with an average annual flow greater than 5 cubic feet per second) that would be crossed by the proposed route are listed in Table 2-7. These were identified using U.S. Geological Survey 1:250,000 scale topographic maps. The largest river that would be crossed by the proposed route is the Green River; other large rivers include the Bear, Blacks Fork (twice) and Sweetwater rivers. Reservoirs are located downstream of several proposed route river crossings: Woodruff Narrows Reservoir is about 20 miles downstream from the crossing of the Bear River; Flaming Gorge Reservoir is about 25 miles downstream from the crossing of the Green River; Pathfinder Reservoir is about 25 miles downstream from the crossing of the Sweetwater River and 7 miles downstream from the crossing of Horse Creek.

Table 2-7 also lists the larger perennial streams and rivers that would be crossed by the alternative routes. Pathfinder Reservoir is located downstream of several alternative river crossings: about 30 miles downstream from the Beef Gap and Beulah Belle Lake alternative Sweetwater River crossing; about 7 miles downstream from the County Line Alternative Sweetwater River crossing; about 7 miles downstream from the Beef Gap Alternative Horse Creek crossing; and about 3 miles downsteam from the Beulah Belle Lake and County Line alternatives' Horse Creek crossings.

Table 2-7. LOCATIONS AND CLASSIFICATIONS OF LARGER PERENNIAL STREAM CROSSINGS

Route	Stream Crossing[a]	Approximate Milepost	Stream Classificatio
Proposed Route	Coyote Creek	8	Unclassified
	Bear River	12	II
	Antelope Creek	28	Unclassified
	Muddy Creek	29	Unclassified
	Blacks Fork	57	III
	Blacks Fork	78	III
	Green River	86	II
	Crooks Creek	195	II
	Sweetwater River	223	II
	Dry Creek	237	Unclassified
	Horse Creek	249	II
	Poison Spider Creek	274	IV
	Casper Creek	285	II
Beef Gap Alternative	Sweetwater River	3	II
	Dry Creek	20	Unclassified
	Horse Creek	32	II
Beulah Belle Lake Alternative	Sweetwater River	5	II
	Dry Creek	23	Unclassified
	Horse Creek	33	II
	Fish Creek	37	II
County Line Alternative	Muddy Creek	8	IV
	Cherry Creek	13	Unclassified
	Sweetwater River	23	II
	Dry Creek	27	Unclassified
	Horse Creek	33	II
	Fish Creek	37	II
Emigrant Gap Alternative	Poison Spider Creek	7	IV

[a] Stream crossings identified on U.S. Geological Survey topographic maps (1:250,000 scale).

[b] The State of Wyoming Department of Environmental Quality classifies streams as Class I (highest quality; no further degradation allowed); Class II (game fish); Class III (non-game fish); and Class IV (poorest quality and not suitable for any fish life).

Surface waters in Wyoming are classified by the Wyoming Department of Environmental Quality (DEQ) according to the beneficial uses for which they are presently suitable or are intended to become. The classifications of perennial streams and rivers crossed by the proposed and alternative routes are also listed in Table 2-7. Surface water quantity and quality data are available for many of the perennial crossings, as shown in Table 2-8. Many of the streams classified as perennial are frequently dry at the point of the proposed and alternative crossings.

Both confined and unconfined ground water aquifers are found along the proposed and alternative routes. Unconfined conditions are primarily found in alluvial and terrace deposits along the Bear, Blacks Fork, Green, Sweetwater, and North Platte rivers. In most other locations along the route(s) usable ground water is found in confined aquifers. Ground-water levels in the alluvial deposits generally range from about the ground surface to 20 feet below. Piezometric levels in confined aquifers vary greatly. In general, they are found from 20 to 100 feet below the ground surface.

100-YEAR FLOODPLAINS

The proposed route and alternatives cross the floodplains of numerous rivers. A portion of the proposed 3/4 Point pump station location on the proposed route lies within a 100-year floodplain.

Documentation is contained in the Water Resources Technical Report.

Table 2-8. WATER QUALITY CHARACTERISTICS AT STREAM AND RIVERS CROSSED BY THE PROPOSED AND ALTERNATIVE ROUTES

	Location		Flow (cfs)			pH (S.U.)			Temperature (°C)			Dissolved Oxygen (mg/1)			Suspended Solids (mg/1)			Specific Conductance (µmhos/cm)			Turbidity (FTU)[a]		
Stream	Latitude	Longitude	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Yellow Creek near Evanston	41° 08' 39"	111° 03' 10"	1.4	43	14.7	7.8	8.3	8.0	0	23.5	8.5	-	-	-	-	-	-	300	875	608	-	-	-
Bear River near Evanston	41° 10' 00"	110° 52' 48"	8.2	565	176	7.5	7.9	7.7	0	22	10.4	-	-	-	-	-	-	160	321	250	-	-	-
Muddy Creek near Carter	41° 25' 22"	110° 29' 50"	4.4	35.1	19.8	-	-	8.8	-	-	6	-	-	-	-	-	260	-	-	1865	-	-	80*
Bear River at State Hwy 89	41° 22' 10"	111° 01' 15"	-	-	-	6.9	8.9	8.0	0	25	6.7	7.6	15.1	10.5	-	-	8	80	2941	558	2.6	28	7.8
Blacks Fork near Lyman	41° 27' 08"	110° 10' 20"	0.1	5415	229	6.8	8.9	8.0	0	29	9.5	6.6	12.4	9.3	3	13800	718	300	6000	1860	1* 3	1400* 170	60* 45
Green River near Green River	41° 30' 39"	109° 26' 54"	245	15630	1915	6.4	9.1	8.0	0	23.5	9.6	6.2	13.0	9.9	2	13400	645	257	1460	621	0* 1.1	400* 35	22* 9.4
Blacks Forks River near Little America	41° 32' 46"	109° 41' 34"	7.6	5430	463	7.2	9.8	8.2	0	27	9.0	5.8	12.6	9.6	2	16200	1390	470	5400	1490	0* 4	1000* 270	75* 86
W.F. Crooks Creek near Jeffrey City	42° 20' 56"	107° 51' 45"	0.5	3.5	1.5	-	-	-	2	17	12	-	-	-	4	42	13	300	480	356	1*	3*	1.6*
Sweetwater River near Alcova	42° 27' 28"	104° 11' 45"	5.6	1400	139	6.9	8.6	7.9	0	27.2	8.4	6.3	12.4	9.7	4	242	41	204	590	410	1 1*	15 180*	6 11*
Pathfinder Reservoir Sweetwater Arm	42° 28' 23"	106° 54' 50"	-	-	-	-	-	-	13.5	20.0	16.5	3.2	10.0	6.7	-	-	-	-	-	-	-	-	-
Sweetwater River North of Jeffrey City	42° 31' 40"	107° 48' 00"	-	-	-	-	-	-	0	22	9	7.3	15.6	10	1	67	21	105	561	276	2.4	37	11.4
Poison Spring Creek near Alcova	42° 42' 55"	106° 34' 43"	0.6	9.0	1.7	-	-	-	1	22	12.1	-	-	-	-	-	-	6430	7130	6690	-	-	
Posion Spider Creek near Goose Egg	42° 46' 44"	106° 31' 46"	6.2	16.0	9.6	7.5	8.6	8.0	1	26.6	13.5	-	-	-	-	-	-	2200	4460	3248			
Casper Creek at Casper	42° 50' 52"	106° 21' 32"	3.9	2090	25.3	7.1	9.2	8.3	0	31.5	15.2	5.2	15.2	9.3	-	-	-	1700	8000	4790	1* 5	200* 130	13 18

[a] FTU = Formalin Turbidity Unit; and * = Jackson Turbidity Unit.

SOCIAL AND ECONOMIC CONDITIONS

Potential social and economic impacts of the proposed action and alternatives were assessed for the following five potentially affected counties in Wyoming: Carbon, Fremont, Natrona, Sweetwater, and Uinta. Impacts were assessed for five urban centers: Rawlins, Casper, Green River, Rock Springs, and Evanston. In addition, potential impacts on the smaller communities of Jeffrey City and Granger were assessed.

The pipeline would be built in four spreads, each of which would employ 100 to 125 construction workers for an estimated 4 to 6 months. In addition, between 10 and 20 temporary workers would be employed for construction of each pump station. Three of the five communities where construction workers are likely to be housed are currently experiencing a shortage of temporary housing (rental units, mobile home spaces, and motel rooms). That could be exacerbated by work force demand associated with the Frontier project. Current and projected housing availability in these 3 communities (Green River, Rock Springs, and Evanston) is described below.

Green River

The population of Green River in 1980 was 12,807. By 1983 it is projected to be 14,604 (Sweetwater County Association of Governments, 1981). The 1980 Bureau of Census data indicates that between 1970 and 1980 Green River's population increased by 205 percent. The current temporary housing market in the community is very tight. The vacancy rate for rental units is approximately 2 percent (about 85 units), and it is anticipated that the rate will be the same in 1983. A total of 1200 housing units are proposed to be built by 1985; however, even with this increase, the supply will not be able to meet the projected increasing demands (Williams, 1982).

Rock Springs

Population in Rock Springs is projected to increase from 19,454 in 1980 to 21,481 in 1983 (Sweetwater County Association of Governments, 1981). Availability of temporary housing is currently a significant problem in Rock Springs. Apartment vacancies are running from 1/2 percent to 1 percent (between 38 and 75 units). Mobile homes and mobile home spaces have virtually no vacancies. In the past, there have been problems with temporary construction workers living in trailers parked illegally on public and private lands in and around Rock Springs (Unger, 1982).

Evanston

Evanston's population is expected to increase from 7,728 in 1980 to 13,969 in 1983, an increase of 81 percent for the three-year period (Williams, 1982). The current vacancy rate for both permanent and temporary housing units in Evanston is virtually zero. It is anticipated that the vacancy rate will not improve by 1983, and temporary housing will continue to be in short supply in Evanston for the foreseeable future (Young, 1982).

RECREATION RESOURCES

Documentation of the detailed analysis of nonurban recreation resources is contained in the Recreation Technical Report (refer to the Social and Economic Conditions Technical Report for the detailed urban recreation analysis).

Recreation resources are geophysical areas designated for the enjoyment and relaxation of residents of the region and visitors to the area. They include lands that are formally managed (such as designated recreation sites or parks) and other areas where dispersed activities take place (such as sightseeing, rockhounding, hiking, offroad vehicle [ORV] use, hunting and fishing, etc.). Recreation resources are categorized under two major subheadings: nonurban resources (all of the parks, public lands, dispersed use areas, waterways, and visitor attractions outside of defined urban areas); and urban oriented resources (those parks and facilities within the incorporated boundaries of cities and towns).

Nonurban recreation resources inventoried for this assessment included both managed areas and dispersed use areas that could be directly or indirectly affected by the construction, operation, maintenance, or abandonment phases of the proposed action and alternatives. By definition, this includes recreation lands which would actually be traversed by the project, and those areas where project activities (such as construction noise and dust) might be noticeable enough to affect the quality of the recreation experience at nearby sites. Also included in the recreation inventory were recreation use areas and attractions where increased visitor use related to the project work force could affect the recreation resource. (For a comprehensive list of nonurban recreation resources within the study region see the Recreation Technical Report.)

Urban recreation resources inventoried for this assessment included parks, playgrounds, softball/baseball fields, swimming pools and other urban outdoor recreation facilities in the potentially affected communities of Evanston, Green River, Rawlins, Rock Springs, and Casper. (For a comprehensive list of urban outdoor recreation facilities see the Social and Economic Conditions Technical Report.)

The recent increase in population in the study region has resulted in greater demand for recreational facilities. The expansion of recreation facilities often lags behind population growth and needs. As a consequence, some of the more popular recreation facilities, such as softball fields and gymnasiums, are overcrowded. Both indoor and outdoor community recreation facilities in Evanston are currently strained. Even with the addition of five new ball fields last year, the demand for ball fields exceeds the supply (Poppinga, 1982). According to the director of Parks and Recreation, Green River has a very limited number of parks and facilities, and community softball fields are in poor shape (Egli, 1982). Rawlins is also experiencing a strain on local recreation facilities. During the summer months softball fields are used to capacity, as are gymnasiums (Bessler, 1982). The urban recreation facilities in Rock Springs are only strained during the winter months when residents tend to recreate indoors. In Casper, local recreation facilities are operating below capacity and can accommodate additional users (Harms, 1982).

WILDERNESS VALUES

For this analysis, wilderness resources are defined as those geophysical areas either formally designated or identified for study (e.g., Wilderness Study Areas, Roadless Area Review and Evaluation [RARE II] areas) as having particular natural or ecological characteristics of such quality as to be set aside and managed for the purposes of preservation and for historical, scientific, scenic, educational, or unconfined and primitive recreational use by the public. Since there are no RARE II areas within the region of study, only Wilderness Study Areas (WSAs) are addressed. There are a total of eleven WSAs within 10 miles of the proposed and alternative routes. The eleven WSAs are: Buffalo Hump (WY-040-306); Sand Dunes (WY-040-307); Alkali Draw (WY-040-311); South Pinnacles (WY-040-313); Alkali Basin-East Sand Dunes (WY-040-316/317); Red Lake (WY-040-318); Sweetwater Rocks (WY-030-120; 122; 123a; and 123b); and Ferris Mountains (WY-030-407).

The location of WSAs with respect to the proposed and alternative routes is contained in the Wilderness Values Technical Report.

VISUAL RESOURCES

Visual resources is a term used to describe both the visual character and the visual quality of the landscapes traversed by the proposed action and alternatives. Visual character refers to the objective description of the physical features of the landscape setting, such as topography, vegetation, water, and soils, and their overall contribution to the line, form, texture, and color of the landscape composition. Visual quality refers to the distinctive way that these resources combine to result in a distinctive scene, and to the relative value placed on the landscape by the viewing public.

The procedure adopted by BLM is used as the primary reference for analysis. The BLM procedure, entitled the Visual Resource Management (VRM) system (described in BLM manual 8400 and available in BLM district offices) provides a standardized method for inventorying and classifying the visual resources within each district. The VRM classification is based on an evaluation of the existing landscape in terms of its scenic quality (outstanding features), visual sensitivity, and viewing distances. There are five possible VRM classes--I through V (see glossary for definitions of each class)--where I represents the most highly valued, pristine landscape, and II through V represent, in descending order, natural landscapes that have either been modified or lack distinguishable features to the extent of needing rehabilitation. The VRM classes are used as a guide by the BLM in determining the degree of compatibility between the landscape and the proposed development.

The proposed and alternative pipeline routes traverse a variety of visual management classes. Each was assessed for visual consequences. Table 2-9 describes landscapes within 2 miles of the proposed and alternative pipeline routes where important visual resources exist. River and trail crossings are identified for their scenic as well as historic value. A complete listing of trail crossings is included in the Visual Resources Technical Report. Milepost segments not included in Table 2-9 do not contain important visual resources or would be beyond the "seen-area" of sensitive viewing points.

CULTURAL RESOURCES

A BLM Class I Inventory has been conducted by Commonwealth Associates, Inc. The inventory provides a synthesis of the cultural history of the project area as well as a compilation of previously recorded resources within a one-mile-wide study area centered on the proposed and alternative routes. The inventory report acts as the background documentation for the EIS.

The region through which the proposed action and alternatives passes has been inhabited periodically since Paleo-Indian time (11,000 years before present). The inventory indicates that 271 previously recorded sites are located within the study area. Of these, 223 are prehistoric sites, the majority of which are camps and lithic scatters. Other site types are stone circles, quarry sites, and food processing sites. Twenty-nine of the sites are historic resources that include structures, camps, trails, and landmarks. Twenty-one sites have both historic and prehistoric material.

Areas where prehistoric resources may be located are near water sources, such as playa lakes, springs, and perennial and intermittent drainages and their confluences; at areas close to subsistence resources such as game trails, wild plants, and tool raw materials;

Table 2-9. IMPORTANT VISUAL RESOURCES

Route and Approximate Milepost	BLM Resource Area	VRM Class	Dominant Visual Features
Proposed Route			
MP 10-12	Kemmerer/ Rock Springs District	IV	California Emigrant Trail and Oregon Trail.
MP 12-14	Kemmerer	II	Bear River crossing; riparian growth of cottonwood, willow, and juniper offer variety in color and texture, of high scenic value.
MP 41	Kemmerer	IV	California Emigrant Trail.
MP 86-88	Big Sandy/ Rock Springs District	II	Green River crossing; high sensitivity; heavy recreational use (float boating, fishing). Linear unit consisting of dominate color and texture from cottonwoods along river bank. Scenic quality "B". Stauffer Chemical Plant north of crossing—major human intrusion of landscape.
MP 110-114	Big Sandy	III	Set of Indian drawings known as White Mountain Petroglyphs (Sec. 11, T22N, R105N) located in the upper Wasatch formation provide educational and historic resources. Surrounding landscape is predominately undisturbed and natural which provides a realistic context for visitors to the petroglyphs.

Table 2-9. IMPORTANT VISUAL RESOURCES (continued)

Route and Approximate Milepost	BLM Resource Area	VRM Class	Dominant Visual Features
Proposed Route (continued)			
MP 150-180	Big Sandy	III	Traverses Red Desert; a VRM III Class "C" scenic area noted for its red coloration. Numerous energy activities have intruded on the naturalness of the southern portion, while the majority of the northern portion is natural. This desert is known for its expansiveness of barren land.
MP 196	Lander/ Rawlins District	II/V	Continental Divide National Scenic Trail corridor. Skirts the northwest boundary of Green Mt. (VRM II Class "A" landscape) through an area with uranium mining activity. The form and color of the mountain and upper elevation vegetation dominate.
MP 215-217	Lander	III	ROW crosses Highway 287 about 0.5 mile southeast of Split Rock Interpretive Site and Viewing Area. The Split Rock-Lankin Dome area is a VRM II Class "A" landscape of high sensitivity because of its scenic recreational and historical value. This area of the Sweetwater Rocks WSA has been nominated for consideration as a National Historic Landmark because of its proximity and tie to the Oregon and Mormon Trail which passes between the viewing area and rock formation. The Sweetwater River, another prominent visual feature in the middle-ground winds its way across the Valley floor south of the Sweetwater

Table 2-9. IMPORTANT VISUAL RESOURCES (continued)

Route and Approximate Milepost	BLM Resource Area	VRM Class	Dominant Visual Features
Proposed Route (continued)			
			Rocks. Riparian vegetation along the river offers interesting color and texture to the landscape scene. This river has been identified in the Phase I inventory by the former Heritage Conservation and Recreation Service (HCRS) for protection as a national, natural, scenic and recreational river.
MP 217-230	Lander	III	The foreground landscape along this segment is open grasslands belonging to the Sun Ranch and is used for grazing. Both the Sweetwater River and the California Emigrant Trail wind across the middleground offering line, color, and historic interest to the scene. The Sweetwater Rock Formation provides the scenic background enclosure to the landscape. An unoccupied cabin is situated along the river at approximately MP 218. The landscape is predominatly natural with only faint signs of the trail and a 2-track road evident. Landscape features through the U.T. Gap include desert grasses and undulating open hills on either side of the dominating rock formation. The mottled texture of vegetation in the foreground is backed by strong form, texture and colors of the rock formation on either side of the pass. An existing 2-track road is the only human intrusion in the landscape.

Table 2-9. IMPORTANT VISUAL RESOURCES (continued)

Route and Approximate Milepost	BLM Resource Area	VRM Class	Dominant Visual Features
Proposed Route (continued)			
MP 230-287	Platte River/ Casper District	III/IV	Landscapes common to area, little variety in color, line, texture or form; and limited access to public, passes near Bessemer Bend (MP 275) recreation site.
Beef Gap Alternative			
MP 0-15	Lander	III	ROW crosses Highway 287 about 0.5 mile southeast of Split Rock Interpretive Site and Viewing Area. The Split Rock-Lankin Dome area is a VRM II Class "A" landscape of high sensitivity because of its scenic recreational and historical value. This area of the Sweetwater Rocks WSA has been nominated for consideration as a National Historic Landmark because of its proximity and tie to the Oregon and Mormon Trail which passes between the viewing area and rock formation. The Sweetwater River, another prominent visual feature in the middle-ground, winds it way across the Valley floor south of the Sweetwater Rocks. Riparian vegetation along the river offers interesting color and texture to the landscape scene. This river has been identified in the Phase I inventory by the former HCRS for protection as a national, natural, scenic and recreational river. The ROW travels through Beef Gap following an existing unimproved dirt road and pipeline ROW through the Sweetwater Rocks formation.

Table 2-9. IMPORTANT VISUAL RESOURCES (concluded)

Route and Approximate Milepost	BLM Resource Area	VRM Class	Dominant Visual Features
Beulah Belle Lake Alternative			
MP 0-15	Lander	III	Same as Beef Gap Alternative (above), except the initial 2 to 3 miles dip further south—staying further away from the Split Rock Viewing Area.
County Line Alternative			
MP 15-25	Lander	III	Route crosses the southern portion of the historic Devils Gate BLM Interpretive Site (route is adjacent to Highway 220 in this area). The Viewing Area provides public access to scenery north of Highway 220. Human modifications include ranch buildings and fences, and roadway. Sweetwater River also winds across middleground of landscape, providing interesting line as well as color and texture of riparian growth. Pipeline passes Independence Rock along Highway 220 (and Oregon Trail route) and the Sweetwater River at approximately MP 25. This site is coined as "Register of the Desert" because it served as a landmark for travellers on the Oregon Trail. Independence Rock has been identified as a potential certified protected segment of the Mormon Pioneer National Historic Trail (Oregon Trail).
Emigrant Gap Alternative			
MP 0-13.75	Platte River	III	No important visual resources were identified for this alternative.

near features which provide shelter from wind and weather; at areas and people; and at areas of topographic breaks, such as escarpments and broken hills. Sand dunes have a high potential for containing sites because of their specilized ecology.

Locations within the project study area where prehistoric resources can be expected are at major rivers and their tributaries (such as the North Platte, Sweetwater, Black Fork, and Green rivers); in the Great Divide and Green River basins near playa lakes and intermittent drainages; and at sand dunes and areas of topographic relief. One prehistoric resource along the proposed route is nominated for inclusion on the National Register of Historic Places (NRHP).

Areas with sensitive historic resources are usually near historic trails, early communication sites, and early settlements.

Trails known to be in the project area include the Oregon, Mormon, California, Overland, Captain B.L.E. Boneville's route (1832), Robert Stuart's route (1812), the Overland Stage and original Pony Express route, the South Pass City to Wamsutter Stage route, the Bridger Trail (1864), and associated historic trail cutoffs. The exact location of these trails in relation to the surveyed pipeline route and the condition of the trails at these locations will not be known until after the Class III field survey is completed. A listing of historic trails which would be affected by the proposed action will be provided in the final EIS.

Other historic sites in the project area include Church Butte, Split Rock Station, Willow Springs-Ryan Hill Historic District, Emigrant Trail, Stuart (Astorians') Cabin site, Bessemer Bend, Red Buttes Stage and Pony Express Station site, Goose Egg Ranch, and Emigrant Gap.

The number of known cultural resource sites within the one-mile-wide study area associated with the proposed and alternative routes are presented below. Some of the known sites are associated with the study area of more than one route. It is important to note that this information is based only on previous field studies conducted along some portions of the proposed and alternative routes. The high or low site density is more a reflection of the amount of previous work performed in that area than of actual site density. Archaeological investigations in the project area were rare until the early to mid-1970s, when compliance with federal cultural resource legislation resulted in many cultural resource inventories related to energy development and exploration. Overall, the Class I overview concluded that low site densities on the northeastern portion of the route were due to few inventories, and high site densities on the southwestern portions were due to many inventories.

Proposed Route

A total of 250 cultural resource sites were identified within the one-mile-wide study area by the Class I overview: 211 are prehistoric sites; 18 are historic sites; and 21 have both prehistoric and historic components. Of these sites, five are on or have been nominated for the NRHP. 107 sites are eligible; 25 of the sites are not eligible for the National Register; and 113 sites have unknown National Register status.

Beef Gap Alternative

The Class I overview revealed no known sites within a one-mile-wide study area for this route.

Beulah Belle Lake Alternative

The Class I overview revealed no known sites within a one-mile-wide study for this route.

County Line Alternative

A total of 11 known cultural resource sites are located within a one-mile-wide study area along this route: two are prehistoric sites and nine are historic sites. Of these, two are on or nominated for the NRHP and one is considered eligible for inclusion on the NRHP.

Proposed Route (MP 214.75-259.1)

A total of five known cultural resource sites are located within a one-mile-wide study area along this section of the proposed route corresponding to the above three alternatives. Two are prehistoric sites and three are historic sites. Three of these sites are on or nominated for the NRHP.

Emigrant Gap Alternative

A total of ten known cultural resource sites are located within the one-mile-wide study area along this route. Eight are prehistoric sites and two are historic. One is on or nominated for inclusion on the NRHP and one is eligible for inclusion.

Proposed Route (MP 267.75-281)

A total of 13 known cultural resource sites are located within a one-mile-wide study area along this section of the proposed route, which corresponds to the Emigrant Gap Alternative. Eight are prehistoric sites and five are historic sites. Four of the sites are on or eligible for inclusion on the NRHP.

CHAPTER THREE
ENVIRONMENTAL CONSEQUENCES

3.1 ASSESSMENT ASSUMPTIONS

The description of the proposed action and alternatives in Chapter One outlines special construction and resource protection practices that the applicant has committed to in order to help mitigate potential adverse environmental impacts. Impact analyses were based on the assumption that the measures outlined in Chapter One would be implemented.

Construction, operation, maintenance, and abandonment of the following project components (detailed in Chapter One) were considered in the impact analysis: proposed and alternative pipeline routes; pump stations; storage tanks; communications system; electrical service; above-ground gate valves and scraper traps; cathodic protection systems; and ROW markers.

Impact analyses were conducted for all resources and impact topics listed in the beginning of Chapter Two. Appendix A presents the criteria for determining potential significance of impacts, which were developed for each resource. A discussion of potential impacts for all resources and impact topics, except as noted in the beginning of Chapter Two, follows. The following discussions focus on those effects having potentially significant (or important) levels of impact from a local perspective. Cumulative impacts are only discussed under the impact topics for which they were identified. All findings are documented in the various technical reports, including those nonsignificant impacts that are also subject to mitigation through BLM stipulations.

3.2 IMPACT ASSESSMENT FINDINGS FOR PROPOSED ACTION AND ALTERNATIVES

The discussions which follow present impact findings for the proposed route (and associated facilities), alternative routes, and the No Action Alternative, where applicable. Impacts associated with the 1.2-mile pipeline extension and Originating pump station are presented in Appendix D.

VEGETATION

The area of each major vegetation type (excluding riparian) in each geographic area unit which would be disturbed by construction of the pipeline and ancillary facilities on the proposed and alternative routes is presented in Table 3-1. The acreage of each riparian vegetation type area which would be disturbed by construction of the pipeline on the proposed and alternative routes is presented in Table 3-2. A detailed description of impacts of project implementation is presented in the Vegetation Technical Report.

Proposed Route

Construction of the pipeline and ancillary facilities on the proposed route would not result in any significant impacts to vegetation (as defined in this analysis). However, locally important negative impacts to specific areas of certain vegetation types may

Table 3-1. AREAS OF MAJOR VEGETATION TYPES WHICH WOULD BE DISTURBED BY PIPELINE AND PUMP STATION CONSTRUCTION ON THE PROPOSED AND ALTERNATIVE ROUTES

Unit	Vegetation Type	Number of Sections Crossed	Total Distance (miles)	Total Area of Vegetation Type In Unit (mi.^{2})	Area Disturbed (mi.^{2})	Percent Total	Impact Significance[a]
Proposed Route							
1	Sagebrush-grass	2	36	1630	.682	.04	NS
	Cropland	1	2	81	.038	.05	NS
2	Sagebrush-grass	2	34	1500	.644	.04	NS
	Sand dune forb-grass	2	9	70	.171	.24	NS
	Cropland	1	4	160	.076	.04	NS
3	Sagebrush-grass	2	18	1460	.341	.02	NS
	Saltbrush-greasewood	2	8	190	.152	.08	NS
4	Sagebrush-grass	1	38	890	.720	.08	NS
	Saltbush-greasewood	3	14	560	.256	.05	NS
	Juniper woodland	1	5	290	.095	.03	NS
5	Sagebrush-grass	6	92	7100	1.742	.02	NS
	Grass-forb	1	9	270	.170	.06	NS
	Cropland	2	7	80	.133	.17	NS
	Sagebrush-grass/ conifer woodland	1	6	90	.114	.13	NS
	Sand dune forb-grass	2	5	100	.095	.10	NS
Beef Gap Alternative							
5	Sagebrush-grass	3	40.5	7100	.767	.01	NS
	Sand dune forb-grass	2	4	100	.076	.08	NS
Beulah Belle Lake Alternative							
5	Sagebrush-grass	2	46.4	7100	.879	.01	NS
	Sand dune forb-grass	1	1	100	.019	.02	NS
County Line Alternative							
5	Sagebrush-grass	1	47.75	7100	.904	.01	NS
Emigrant Gap Alternative							
5	Sagebrush-grass	2	7	7100	.133	<.01	NS
	Cropland	2	4.75	80	.090	.11	NS
	Grass-forb	1	2	270	.038	.01	NS

[a] NS = not significant.

Table 3-2. AREAS OF RIPARIAN HABITAT WHICH WOULD BE DISTURBED BY PIPELINE CONSTRUCTION ON THE PROPOSED AND ALTERNATIVE ROUTES

Route	Milepost	Stream, River, or Canal[a]	Riparian Vegetation Subtype	Total Area in Region (acres)	Area Disturbed (acres)	Percent Total	Impact Significance[b]
Proposed Route	8	Coyote Creek	willow-wet meadow	182	.68	.37	NS
	12	Bear River	cottonwood-willow-wet meadow	485	1.84	.38	NS
	28	Antelope Creek	willow-wet meadow	182	.68	.37	NS
	29	Muddy Creek	willow-wet meadow	182	.68	.37	NS
	43	Austin Canal	willow-wet meadow	36	.14	.39	NS
	47	Austin Canal	willow-wet meadow	36	.14	.39	NS
	57	Blacks Fork	cottonwood-willow-wet meadow	485	1.84	.38	NS
	78	Blacks Fork	cottonwood-willow-wet meadow	485	1.84	.38	NS
	86	Green River	cottonwood-willow-wet meadow	485	1.84	.38	NS
	184	Arapahoe Creek	willow-wet meadow	91	.34	.37	NS
	187	Arapahoe Creek	willow-wet meadow	91	.34	.37	NS
	190	Arapahoe Creek	willow-wet meadow	91	.34	.37	NS
	195	Crooks Creek	willow-wet meadow	182	.68	.37	NS
	200	Sheep Creek	willow-wet meadow	91	.34	.37	NS
	204	West Cottonwood Creek	cottonwood-willow-wet meadow	91	.34	.37	NS
	207	UT Cottonwood Creek	willow-wet meadow	91	.34	.37	NS
	209	East Cottonwood Creek	cottonwood-willow-wet meadow	91	.34	[illegible]	NS
	223	Sweetwater River	willow-wet meadow	364	1.38	.38	NS
	237	Dry Creek	willow-wet meadow	182	.68	.37	NS
	249	Horse Creek	willow-wet meadow	182	.68	.37	NS
	274	Poison Spider Creek	willow-wet meadow	182	.68	.37	NS
	285	Casper Creek	wet meadow	182	.68	.37	NS

Table 3-2. AREAS OF RIPARIAN HABITAT WHICH WOULD BE DISTURBED BY PIPELINE CONSTRUCTION ON THE PROPOSED AND ALTERNATIVE ROUTES (concluded)

Route	Milepost	Stream, River, or Canal[a]	Riparian Vegetation Subtype	Total Area in Region (acres)	Area Disturbed (acres)	Percent Total	Impact Significance[b]
Beef Gap Alternative	3	Sweetwater River	willow-wet meadow	364	1.38	.38	NS
	20	Dry Creek	willow-wet meadow	182	.68	.37	NS
	32	UT Horse Creek	willow-wet meadow	182	.68	.37	NS
Beulah Belle Lake Alternative	5	Sweetwater River	willow-wet meadow	364	1.38	.38	NS
	23	Dry Creek	willow-wet meadow	182	.68	.37	NS
	33	Horse Creek	willow-wet meadow	182	.68	.37	NS
	37	Fish Creek	willow-wet meadow	182	.68	.37	NS
	40	Shell Creek	willow-wet meadow	182	.68	.37	NS
County Line Alternative	8	Muddy Creek	willow-wet meadow	182	.68	.37	NS
	13	Cherry Creek	willow-wet meadow	182	.68	.37	NS
	23	Sweetwater River	willow-wet meadow	364	1.38	.38	NS
	27	Dry Creek	willow-wet meadow	182	.68	.37	NS
	34	Horse Creek	willow-wet meadow	182	.68	.37	NS
	37	Fish Creek	willow-wet meadow	182	.68	.37	NS
	40	Shell Creek	willow-wet meadow	182	.68	.37	NS
Emigrant Gap Alternative	6.3	Poison Spider Creek	willow-wet meadow	182	.68	.37	NS
	6.9	Unnamed Stream	willow-wet meadow	182	.68	.37	NS
	7.7	UT Casper Canal	willow-wet meadow	182	.68	.37	NS
	10.5	UT Casper Canal	willow-wet meadow	182	.68	.37	NS
	10.6	Unnamed Stream	willow-wet meadow	182	.68	.37	NS
	13.1	UT North Platte River	willow-wet meadow	182	.68	.37	NS

[a] UT = unnamed tributary.

[b] NS = not significant.

occur. These vegetation types include sand dune forb-grass, saltbush-greasewood, and any types present on steep slopes. Areas of the sand dune forb-grass vegetation type are sensitive to disturbance because: disturbed areas may increase in size due to wind erosion; natural establishment of vegetation requires long periods of time; and revegetation of disturbed sand dunes is difficult (Schaller and Sutton 1978, Bradshaw and Chadwick 1980). Areas of the saltbush-greasewood type may be difficult to revegetate because of problems caused by high soil salinity and alkalinity and heavy clay soils. In addition, any areas of vegetation on steep slopes may be difficult to revegetate because: soils on steep slopes are often shallow and rocky; soil water retention on steep slopes is reduced due to high runoff; and water erosion on steep slopes may reduce revegetation success by reducing soil depth and washing away seeds. Additional important construction-related impacts to each major vegetation type are discussed in detail in the Vegetation Technical Report.

Normal operation, maintenance, and abandonment of the pipeline and ancillary facilities on the proposed route would result in no significant impacts to vegetation. An accidental oil spill would have a negative impact on the vegetation in the area of the spill. Based on oil toxicity, reduced growth, mortality, and reduced reproductive success would be the primary impacts which would result from an accidental oil spill. The significance of the impact resulting from a spill is dependent on the total area of the spill; i.e., a very large spill could result in a significant impact. Depending on the success of the clean-up effort, a spill could potentially have a long-term effect on plant maintenance, growth, and reproductive capability.

Alternative Routes

Normal construction, operation, maintenance, and abandonment of the pipeline on any of the four alternative routes would result in no significant impacts on vegetation. Potential impacts to vegetation from an accidental oil spill on the four alternative routes are the same as discussed for the proposed route. Although no significant impacts to vegetation were identified for the proposed or alternative routes, it is possible to discern minor differences in impacts for the various routes. A comparison of all four alternatives against the corresponding portions of the proposed route follows.

Beef Gap Alternative. Construction of this alternative would disturb the following percentages of the total area of the applicable vegetation types in geographic area unit 5: 0.01 percent for sagebrush-grass and 0.08 percent for sand dune forb-grass, versus 0.01 percent and 0.10 percent, respectively, for the corresponding portion of the proposed route.

Beulah Belle Lake Alternative. Construction of this alternative would disturb the following percentages of the total area of the applicable vegetation types in geographic area unit 5: 0.01 percent for sagebrush-grass and 0.02 percent for sand dune forb-grass, versus 0.01 percent and 0.10 percent, respectively, for the corresponding portion of the proposed route.

County Line Alternative. Construction of this alternative would disturb 0.01 percent of the total area of the sagebrush-grass vegetation type in geographic area unit 5, which is the same percentage that the corresponding portion of the proposed route would disturb. The corresponding portion of the proposed route would also disturb 0.10 percent of the total area of the sand dune forb-grass vegetation type in geographic area unit 5.

Emigrant Gap Alternative. Construction of this alternative would disturb the following percentages of the total area of the applicable vegetation types in geographic area unit 5: <0.01 percent for sagebrush-grass, 0.11 percent for cropland, and 0.01 percent for grass-forb; versus <0.01 percent, 0.07 percent, and 0.02 percent, respectively, for the corresponding portion of the proposed route.

LIVESTOCK GRAZING

No significant adverse impacts to livestock grazing would result from construction or operation of the proposed action or alternatives. Potentially affected AUMs for the proposed action and alternatives are discussed below.

Proposed Route

Construction of the proposed route (including pump stations) would remove approximately 212 AUMs until the ROW was revegetated. This impact is not considered significant.

Beef Gap Alternative

Construction of this alternative route would remove approximately 34 AUMs versus about 32 AUMs for the corresponding portion of the proposed route.

Beulah Belle Lake Alternative

Construction of this alternative route would remove approximately 38 AUMs versus about 32 AUMs for the corresponding portion of the proposed route.

County Line Alternative

Construction of this alternative route would remove approximately 39 AUMs versus about 32 AUMs for the corresponding portion of the proposed route.

Emigrant Gap Alternative

Construction of this alternative route would remove approximately 8 AUMs versus about 9 AUMs for the corresponding portion of the proposed route.

AQUATIC BIOLOGY

The removal of river substrate as a result of trench-and-fill activities could result in the loss of 3.5 pounds (dry weight) of invertebrates for every 10 feet of stream crossed (Dehoney and Mancini 1982). If it is assumed that all removed invertebrates would be killed, this impact would be considered locally adverse. It is anticipated, however, that population reestablishment in the disturbed areas would be complete within a few months of construction completion; thus impacts would be of short duration and would be considered insignificant. Similar macroinvertebrate recovery rates have been recently documented by Gartman (1981) and Tsui and McCart (1981).

General river bank and instream construction activity would be expected to increase stream turbidity and siltation (EPA 1976). It is well established that chronic stream siltation contributes to a general decrease in stream productivity (Karr and Schlosser 1978, Stern and Stickle 1978). It has been demonstrated under natural conditions, however, that fishes and invertebrates do not remain in areas of high turbidity (White and Gammon 1977, Peters 1967, Herbert et al. 1961, Burnside 1967). It is anticipated, therefore, that the most notable fisheries impact associated with construction-related turbidity would be a potential reduction in reproductive success. Although river bank and instream construction activity would increase stream turbidity levels, it is not possible to make precise estimates of potential concentrations without more site specific information (e.g., river substrate composition, river depth and velocity at crossing). Refer to the Water Resources Technical Report (Section 3.2) for worst-case estimates of suspended solids concentrations associated with construction of perennial river crossings. These estimates indicate that concentrations in excess of 1000 mg/l could be sustained over 200 feet downstream of large perennial stream crossings and over 10 feet downstream of small perennial stream crossings.

Predictions of fish population declines associated with mortality of fish eggs/macroinvertebrates (due to increased turbidity levels) and disruption of fish spawning are also not possible without additional site specific aquatic habitat data. A recent publication by Zallen (1982) points out that most turbidity-related fisheries impacts are associated with long-term chronic sedimentation conditions, of which there are none associated with this project.

It is anticipated that aquatic biological disturbances associated with pipeline construction including fish spawning and macroinvertebrate impacts, would be localized and of short duration (i.e., would affect one year class at most), and thus would be insignificant.

A comparison of the four alternatives against the corresponding portions of the proposed route in regard to number of streams crossed (by type) and fishery resource classifications follows. In general, impacts due to invertebrate mortality and siltation would be expected to be higher in perennial streams than in intermittent streams because many intermittent streams would be dry during the proposed construction period (i.e., May to November).

Beef Gap Alternative

This alternative crosses 3 perennial and 11 intermittent streams (1-Class 3, 3-Class 4), versus 3 perennial and 16 intermittent streams (1-Class 3, 4-Class 4) for the corresponding portion of the proposed route.

Beulah Belle Lake Alternative

This alternative crosses 5 perennial and 7 intermittent streams (1-Class 3, 6-Class 4), versus 3 perennial and 16 intermittent streams (1-Class 3, 4-Class 4) for the corresponding portion of the proposed route.

County Line Alternative

This alternative crosses 7 perennial and 19 intermittent streams (1-Class 3, 6-Class 4), versus 3 perennial and 16 intermittent streams (1-Class 3, 4-Class 4) for the corresponding portion of the proposed route.

Emigrant Gap Alternative

This alternative crosses 6 perennial and 2 intermittent streams (none classified), versus 2 perennial and 2 intermittent streams (none classified) for the corresponding portion of the proposed route.

Threatened and Endangered Species

There are no federal or state protected "sensitive classification" aquatic species anticipated to be affected by routine construction, operation, maintenance, or abandonment procedures for the proposed action or alternatives. A number of sport fisheries could be affected by project implementation, however, and these have been identified in Section 2.2, Table 2-4.

WILDLIFE

Construction, operation, maintenance, and abandonment of the proposed action, alternatives, and associated facilities could potentially result in two types of impacts on wildlife: physical changes in habitat structure, and disturbance resulting from human presence and activity (including equipment). Physical changes in habitat structure would result from the removal of existing vegetation and establishment of perennial grasses. Physical changes in habitat structure would result in habitat loss such as food and cover for certain species. Specifically, habitat loss would represent loss of required resources including food. The length of presence of the modified vegetation would be dependent on revegetation success and patterns of secondary plant succession. Habitat change and disturbance resulting from human presence and activity (including equipment) could potentially result in mortality (of adults, young, and eggs) and reduced reproductive success. Direct mortality could result from crushing of relatively immobile adults, young, and eggs. Indirect mortality could result from loss of habitat--i.e., loss of required resources, including food (resulting in starvation) and protection areas (resulting in increased predation). Direct reduction of reproductive success could result from stress caused by disturbance resulting from human presence and activity (including equipment).

Wildlife that could be affected by the proposed action or alternatives is discussed below.

Pronghorn

The pronghorn is a herbivorous species which feeds primarily on shrubs (especially sagebrush and rabbitbrush species), especially in the winter (Severson and May 1967, Severson et al. 1968, Taylor 1972, Sundstrom et al. 1973). Forb, grass, and grasslike species are relatively minor food species. Therefore, this species is dependent on sagebrush-and rabbitbrush-dominated habitats for this important resource. Food availability is most critical in the winter, when environmental conditions are most severe. The following discussion describes potential impacts on pronghorn resulting from disturbance of areas of crucial winter range and crucial winter/yearlong range on the proposed and alternative routes.

Proposed Route. The maximum percentage of any single area of pronghorn crucial winter range which would be disturbed by construction of the pipeline and ancillary facilities is 0.25 percent. The maximum percentage of any single area of crucial winter/yearlong range which would be disturbed is 0.14 percent. These losses of habitat are extremely small and are considered insignificant. However, existing high-quality pronghorn habitat would be reduced in area by the conversion of sagebrush, rabbitbrush, and other dominant habitats to perennial grass-dominated habitats. The duration of this negative impact would likely be long-term and is dependent on the time required for sagebrush and rabbitbrush cover to reestablish. It is likely that this would require 15-30 years (Fisser 1980, Frischkect 1968, and Tisdale and Hironka 1981). Human presence and activity (including equipment) associated with construction would temporarily disturb pronghorn although this negative impact is expected to be very minor in magnitude and would be short-term.

Human presence and activity (including equipment) associated with operation, maintenance, and abandonment of the pipeline and ancillary facilities on the proposed route are also expected to result in no significant impacts on pronghorn.

Alternative Routes. The maximum percentage of any single area of pronghorn crucial winter range which would be disturbed by construction of the pipeline on any alternative route is 0.44 percent (County Line Alternative). The maximum percentage of any single area of crucial winter/yearlong range which would be disturbed is 0.13 percent. These percentage losses of habitat are extremely small and are considered insignificant. Additional comments made with regard to the proposed route also apply to all alternative routes. A comparison of the four alternative routes against the corresponding portions of the proposed route in regard to miles of pronghorn crucial winter range and crucial winter/yearlong range (and percentages of total important habitat areas which would be disturbed) follows.

Beef Gap Alternative. Construction of this alternative would disturb 7.5 miles (0.25 percent) of crucial winter range and 2.5 miles (0.02 percent) of crucial winter/yearlong range, versus 7.5 miles (0.25 percent) and 13.25 miles (0.11 percent), respectively, for the corresponding portion of the proposed route.

Beulah Belle Lake Alternative. Construction of this alternative would disturb 3.5 miles (0.21 percent) and 10.5 miles (0.36 percent) of crucial winter range, and 3.5 miles (0.03 percent) of crucial winter/yearlong range; versus 7.5 miles (0.25 percent), and 13.25 miles (0.11 percent), respectively, for the corresponding portion of the proposed route.

County Line Alternative. Construction of this alternative would disturb 8 miles (0.44 percent) and 10.5 miles (0.36 percent) of crucial winter range, and 15.5 miles (0.13 percent) of crucial winter/yearlong range; versus 7.5 miles (0.25 percent), and 13.25 miles (0.11 percent), respectively, for the corresponding portion of the proposed route.

Emigrant Gap Alternative. Neither the Emigrant Gap Alternative nor the corresponding portion of the proposed route would disturb any pronghorn crucial winter range or crucial winter/yearlong range.

Mule Deer

The Mule Deer is also a herbivorous species which feeds primarily on shrubs (especially sagebrush, bitterbrush, and rabbitbrush), especially in the winter (Goodwin 1975, Tueller and Monroe undated). Forb, grass, and grasslike species are relatively important food species in the spring and early summer when utilization is relatively high. Food availability is most critical in the winter, when environmental conditions are most severe. The following subsection describes potential impacts on mule deer which are considered likely to result from disturbance of areas of crucial winter range and crucial winter/yearlong range on the proposed and alternative routes.

Proposed Route. The maximum percentage of any single area of mule deer crucial winter range which would be disturbed by construction of the pipeline and ancillary facilities is 0.03 percent. The maximum percentage of any single area of crucial winter/yearlong range which would be disturbed is 0.12 percent. These percentage losses of habitat are extremely small and are considered insignificant. However, existing high-quality mule deer habitat would be reduced in area by conversion of shrub-dominated habitat to habitat dominated by perennial grasses. The duration of this impact would likely be long-term and is dependent on the time required for shrub (especially sagebrush, bitterbrush, and rabbitbrush) cover to develop. It is likely that this would require 15-30 years (Fisser 1980; Frischkect 1968; and Tisdale and Hironka 1981).

Human presence and activity (including equipment) associated with operation, maintenance, and abandonment of the pipeline and ancillary facilities on the proposed route are also expected to have no significant impacts on mule deer.

Alternative Routes. No alternative routes cross any areas of mule deer crucial winter range or crucial winter/yearlong range.

Elk

Proposed Route. Construction of the pipeline on the proposed route would result in no disturbance to wintering elk on winter range located between MPs 90-100 and 125-140 in the Red Desert area, because construction activities are only proposed for the spring, summer, and fall. Habitat modifications would result in no significant impacts on these wintering herds. No disturbance to calving elk would occur in the calving area located between MPs 110-111, because a BLM stipulation to the ROW grant would prevent construction activities in this area between May 10 and June 30. Habitat modification in this area would result in no significant impacts on calving elk. Operation, maintenance, and abandonment of the pipeline in these elk habitat areas would have no significant effects on elk.

Alternative Routes. No elk habitat areas were identified along any of the alternative routes; thus no significant impacts to elk would occur from construction, operation, maintenance, or abandonment of any of the alternatives.

Sage Grouse

The occurrence, distribution, and abundance of sage grouse are directly related to the distribution of sagebrush-dominated habitats. This species is entirely dependent on sagebrush as a primary food source for most of the year, especially in the fall, winter, and spring (Gray 1967, Peterson 1970, Wallestad 1975, Wallestad et al. 1975). Sage grouse strutting grounds are typically located on open areas surrounded by sagebrush habitat (Wallestad and Schladweiler 1974). Most nests are located within 2 to 3 miles of strutting grounds under sagebrush plants (Wallestad and Pyrah 1974). Brood-rearing areas are typically meadow areas surrounded by sagebrush habitat (Wallestad 1971). Wintering areas are primarily located in sagebrush habitat (Eng and Schladweiler 1972).

Proposed Route. The proposed route crosses within 2 miles of 12 sage grouse strutting grounds. Six of the 12 strutting grounds are located within approximately 1 mile of the proposed route. Disturbance of courtship activities resulting in reduced reproductive success of some individuals could result if construction activities occurred in the early morning (0500-0800 hrs.) in late March, April and early May within approximately 1 mile of a strutting ground (BLM 1974). The degree of potential reduced reproductive success is difficult to quantify. However, assuming that standard BLM stipulations for avoiding active sage grouse strutting grounds would be imposed on this project, disruption of courtship activities would probably be minimal.

Construction of the proposed route would disturb approximately 1 percent of a 3.5 square mile sage grouse wintering area located between mileposts 209.5 and 211.5. This habitat modification would constitute a signficant impact (as defined for this analysis), which may result in a population decline of the population which utilizes this area. The size of the population which utilizes this area is unknown; therefore, a detailed analysis of the degree of potential mortality resulting from loss of the disturbed area is not possible. The duration of the impact would likely be long-term and would be the time required for substantial sagebrush cover to develop on the disturbed area. Recovery would likely require 15-30 years (Fisser 1980, Frischkect 1968, and Tisdale and Hironka 1981).

Direct negative impacts on reproductive success in any area of occupied habitat would result from crushing of eggs and young in nests in cleared areas. Indirect mortality could result from disturbance of incubating females if nests were permanently abandoned or eggs or young are chilled or overheated as a result of temporary abandonment.

Conversion of all disturbed areas of sagebrush-grass habitats to habitats comprised of perennial grasses would eliminate sage grouse habitat (Trueblood 1954, Enyeart 1956, Schneegas 1967, Autenreith 1969, Klebenow 1970, Martin 1970, Wallestad 1975, Braun et al. 1977).

The duration of this impact would likely be long-term (15-30 years [Fisser 1980, Frischkect 1968, and Tisdale and Hironka 1981]), based on the time required for sagebrush cover to reestablish on disturbed areas.

Alternative Routes. None of the alternative routes cross any sage grouse wintering areas. Comments on potential impacts on sage grouse made with regard to the proposed route also apply to the four alternative routes. A comparison of the four alternative routes against the corresponding portions of the proposed route in regard to the number of sage grouse strutting grounds within 2 miles follows.

Beef Gap Alternative. This alternative route comes within 2 miles of 1 strutting ground, versus 2 strutting grounds for the corresponding portion of the proposed route.

Beulah Belle Lake Alternative. This alternative comes within 2 miles of 3 strutting grounds, versus 2 strutting grounds for the corresponding portion of the proposed route.

County Line Alternative. This alternative comes within 2 miles of 3 strutting grounds, versus 2 strutting grounds for the corresponding portion of the proposed route.

Emigrant Gap Alternative. This alternative route comes within 2 miles of 1 strutting ground, while the corresponding portion of the proposed route does not come within 2 miles of any sage grouse strutting grounds.

Raptors

Nesting raptors (hawks, falcons, eagles, and owls) as a group are generally sensitive to disturbance caused by human presence and activity. Human presence and activity within specific distances of nests can result in abandonment of eggs and young, resulting in indirect mortality and reduced reproductive success. Human presence and activity can also cause adults to temporarily avoid nests, resulting in indirect mortality and reduced reproductive success caused by chilling or overheating of eggs and young and possible starvation of young. Direct mortality and reduction of reproductive success caused by destruction of nests with eggs or young of ground-nesting species (burrowing owl and marsh hawk) may result from clearing of the ROW.

The minimum distances at which human presence and activity are tolerated by nesting raptors varies by species, individual pair of adults, and time in the breeding period. The golden eagle, ferruginous hawk, and Swainson's hawk will typically abandon nests with eggs early in the breeding period if significantly disturbed. However, later in the period, after nestlings have hatched, abandonment is less common. The great horned owl is relatively tolerant of disturbance throughout the breeding period. Most raptor species are most sensitive to disturbance (prone to abandonment) early in the breeding period when eggs are in the nest and least sensitive late in the breeding period when young are in the nest. However, disturbance of nestlings late in the breeding period can cause premature fledging, resulting in potential abandonment, injury, and death due to falls, etc. In addition, certain pairs of breeding adults are more sensitive to disturbance than others.

Proposed Route. All of the 3 pairs of breeding raptors associated with nests located within 0.5 mile of the proposed route are susceptible to disturbance. The degree of potential disturbance is dependent on a number of factors which cannot be completely considered at this time, including the specific timing of construction in the breeding period, visibility of construction activity near the nests, and sensitivity of individual pairs to disturbance. However, assuming that standard BLM stipulations limiting the timing and location of construction activities near raptor nests would be applied to this project, the probability of disturbance would be reduced.

Alternative Routes. Comments made with regard to the proposed action also apply to raptor nests located within 0.5 mile of the four alternative routes. A comparison of the four alternative routes against the corresponding portions of the proposed route in regard to the number of raptor nests within 0.5 mile follows.

Beef Gap Alternative. Neither this alternative nor the corresponding portion of the proposed route come within 0.5 mile of any raptor nests.

Beulah Belle Lake Alternative. This alternative route comes within 0.5 mile of 2 raptor nests, while the corresponding portion of the proposed route does not come within 0.5 mile of any raptor nests.

County Line Alternative. This alternative comes within 0.5 mile of 2 raptor nests, while the corresponding portion of the proposed route does not come within 0.5 mile of any raptor nests.

Emigrant Gap Alternative. This alternative route does not come within 0.5 mile of any raptor nests, while the corresponding portion of the proposed route traverses 4 miles of bald eagle winter concentration area.

Other Species

Conversion of the ROW and other disturbed areas from primarily shrub-dominated habitats to perennial grass-dominated habitats would result in substantial changes in the species composition, species diversity, species richness, and absolute density of animal communities comprised of species with small territories or home ranges. Such species include small and medium-sized mammals, birds (songbirds and similar species), reptiles, and amphibians. Species which are closely related to shrub habitats (e.g., Ord's kangaroo rat, bushy-tailed woodrat, sage thrasher, sage sparrow, Brewer's sparrow) would probably decrease in density and species which are closely related to grass-dominated habitats would increase (Reynolds and Trost 1979). These types of changes would result in changes of community species composition, species diversity, species richness, and absolute density. In general, the revegetated ROW comprised of perennial grasses would support animal communities with reduced species diversity, species richness, and absolute density due to a reduction of habitat structural diversity compared to original shrub-dominated habitats where they are present (Reynolds and Trost 1979).

Riparian Habitats

Proposed Route. The areas of the 22 riparian habitats which would be disturbed by construction of the proposed route are small and are not considered significant in relation to the total area of riparian habitat in the region. However, the riparian habitat type is very important to wildlife. Clearing of riparian vegetation would result in reducing the species diversity, species richness, and absolute density of small and medium-sized mammal, bird, reptile, and amphibian communities associated with disturbed areas. The species composition of these communities would also be considerably changed. Areas of special habitat features would also be reduced in number.

Alternative Routes. Comments made with regard to the proposed route also apply to riparian habitats which would be disturbed by construction of the pipeline on the four alternative routes. A comparison of the four alternative routes with the corresponding portions of the proposed route in regard to the number of riparian habitat areas traversed follows.

Beef Gap Alternative. This alternative route and the corresponding portion of the proposed route both traverse 3 riparian habitat areas.

Beulah Belle Lake Alternative. This alternative route traverses 5 riparian habitat areas, versus 3 riparian areas for the corresponding portion of the proposed route.

County Line Alternative. This alternative traverses 7 riparian habitat areas, versus 3 riparian habitat areas for the corresponding portion of the proposed route.

Emigrant Gap Alternative. This alternative route traverses 6 riparian habitat areas, versus 1 riparian habitat area for the corresponding portion of the proposed route.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS), Office of Endangered Species (OES), has indicated that four listed endangered species (black-footed ferret, bald eagle, American peregrine falcon, and whooping crane) potentially (or are confirmed to) occur in the affected area for the project (proposed action and alternatives). The Biological Assessment for the project includes a detailed analysis of potential adverse effects of project implementation on the proposed and alternative routes for each of the four species. The Biological Assessment has been submitted to USFWS.

It has been preliminarily determined that project implementation on the proposed route or any alternative route may affect the black-footed ferret. This determination is based on the lack of sufficient data to allow formulation of a more definitive determination. The final decision regarding potential adverse effects of project implementation on the proposed route or any alternative route on this species will be formulated and submitted to USFWS after completion of surveys for this species on the final route in August and September 1982. Project implementation on the proposed route or any alternative route would have no effect on the bald eagle, American peregrine falcon, or whooping crane. The No Action Alternative would have no effect on any of the four species. In addition, implementation of the project on the proposed route would have no adverse effects on the bald eagle roost area in th Jackson Canyon Area of Critical Environmental Concern (ACEC).

WILD HORSES

Proposed Route

Construction of the pipeline on the proposed route would result in the conversion of various shrub-grass habitats to perennial grass-dominated habitats. This could result in a positive impact on wild horses by providing additional feeding habitat. The duration of this impact is likely to be fairly long term. Disturbance resulting from human presence and activity (including equipment) associated with pipeline and ancilliary facility construction, operation, maintenance, and abandonment would probably have a minimal, short-term, negative impact on wild horses.

Alternative Routes

No wild horse concentration areas are located near any of the alternative routes (or the corresponding portions of the proposed route); therefore any impacts to wild horses would be minor.

PALEONTOLOGY

Direct impacts to paleontological resources are expected to result from the proposed action or alternatives. Impacts are expected to occur primarily during initial construction operations in areas where bedrock disturbance would occur. Vertebrate fossils, particularly mammals, are most likely to be affected. In some areas, adverse mechanical damage to (or destruction of) fossils is likely to be sustained, as well as the loss of data pertaining to the precise geologic context of the fossils. Bedrock disturbance may lead to the recovery of fossils that would not otherwise have been discovered, though their scientific value is often diminished.

Proposed Route

The proposed route traverses six fossil localities (identified in literature and archival search) which could be significantly impacted during construction if adequate mitigation measures were not employed (refer to the Paleontology Technical Report for recommended mitigation measures). The proposed route also comes within 1 mile of an additional 14 identified fossil localities, which could be significantly impacted if the proposed route alignment is changed prior to construction.

It is estimated that approximately 40 percent of the proposed pipeline route, generally in the western portion of the project area, crosses paleontologically sensitive bedrock that is covered by a relatively thin layer of overburden (e.g., 10 to 60 inches). The available paleontological and overburden depth data are not sufficient for accurately determining whether or not pipeline trenching operations would disturb significant buried fossiliferous deposits (i.e., many areas judged to be of high sensitivity would probably not be adversely affected). The qualitative assessment that adverse impacts to significant fossils would likely occur is based on the richness of the fossil resources in the region, and the presence of known fossil localities both within the area of potential direct impact and immediately adjacent to it.

Alternative Routes

A comparison of the four alternative routes against the corresponding portions of the proposed route in regard to number of identified fossil localities which are traversed, number of identified fossil localities within 1 mile, and miles of areas traversed with high paleontological sensitivity and relatively thin overburden cover follows.

Beef Gap Alternative. This alternative route and the corresponding portion of the proposed route both traverse one identified fossil locality and each come within 1 mile of an additional identified fossil locality. The Beef Gap Alternative traverses 2.5 miles of areas with high paleontological sensitivity and relatively thin overburden cover, versus 2 miles for the corresponding portion of the proposed route.

Beulah Belle Lake Alternative. The Beulah Belle Lake Alternative does not traverse any identified fossil localities, but does come within 1 mile of two identified fossil localities, while the corresponding portion of the proposed route traverses one identified fossil locality and comes within 1 mile of an additional identified fossil locality. This alternative traverses 2.4 miles of areas with high paleontological sensitivity and relatively thin overburden cover, versus 2 miles for the corresponding portion of the proposed route.

County Line Alternative. This alternative route does not traverse any identified fossil localities, but does come within 1 mile of two identified fossil localities, while the corresponding portion of the proposed route traverses one identified fossil locality and comes within 1 mile of an additional identified fossil locality. The County Line Alternative traverses 15.2 miles of areas with high paleontological sensitivity and relatively thin overburden cover, versus 2 miles for the corresponding portion of the proposed route.

Emigrant Gap Alternative. Neither the Emigrant Gap Alternative nor the corresponding portion of the proposed route traverse any identified fossil localities, come within a mile of any identified fossil localities, or traverse any areas with high paleontological sensitivity.

The paleontological field inventory (Powers Elevation Company) of portions of the proposed route deemed to be of high paleontological sensitivity identified 5 fossil localities on or adjacent to the proposed pipeline corridor. This paleontological field inventory determined that only 1 of the 5 sites could potentially be significantly impacted during pipeline trenching operations on the proposed route (as surveyed). Four of the sites are outside the area of potential direct impact (i.e., proposed pipeline trench). The applicant has agreed to have the 1 potentially impacted fossil locality (T21N, R106W, Section 20) monitored and carefully examined during the construction phase; thus potential impacts would be mitigated. Refer to the Paleontology Technical Report (Appendix C) for more information regarding the paleontological field inventory which was conducted.

SOILS AND AGRICULTURE

Potentially significant impacts could occur to soils with low reclamation potential disturbed by the proposed action or alternatives if revegetation and erosion control efforts are unsuccessful on these areas. If vegetation was not reestablished at levels equivalent to the predisturbance condition within 5 years, erosion of productive surface soil layers could be accelerated to a point where significant deterioration of the soil resource would occur. Refer to Table 1-5 (Section 1.5) for acreages of soils and topography which would be disturbed during construction of the proposed action and alternatives (including corresponding portions of the proposed route).

Construction of the proposed route would disturb about 97 acres of native hayland and irrigated haylands/croplands. The Emigrant Gap Alternative would disturb approximately 82 acres of irrigated haylands/croplands during construction, versus about 48 acres for the corresponding portion of the proposed route. No other alternatives (or corresponding portions of the proposed route) traverse any native hayland or irrigated haylands/croplands.

No significant impacts to agricultural cropland would result from construction or operation of the proposed action or alternatives. Agricultural production losses as a result of construction would be short-term and therefore insignificant. Private landowners would be compensated by the applicant for such agricultural production losses.

PRIME FARMLAND

No Prime or Unique Farmland would be affected by the proposed action or alternatives.

WATER RESOURCES

Construction

No important or significant impacts on water resources are expected to result from the construction of the proposed action or alternatives. Water quality impacts associated with the construction activities at stream crossings are expected to be of limited extent and duration. Withdrawal of hydrostatic test water (45.4 acre-feet maximum) from the major surface water sources (e.g., Bear, Blacks Fork, Green, Sweetwater, and North Platte rivers) would have little or no effects on downstream water users. Because Permits to Discharge would stipulate appropriate discharge methods in accordance with federal and state standards, disposal of hydrostatic test water would have little effect on surface or ground-water quality.

While downstream effects from construction of stream crossings are not expected to be significant, the total downstream release of sediment would vary between the proposed and alternative routes. Using the total number of large perennial streams crossed (including number of streams which are classified by the Wyoming Department of Environmental Quality [DEQ]) for comparative purposes, sediment release along the proposed and alternative routes would vary as follows.

Proposed Route. Construction of the proposed route would temporarily increase turbidity levels in 13 large perennial streams, 9 of which are classified by the DEQ (6-Class II, 2-Class III, 1-Class IV).

Beef Gap Alternative. Construction of this alternative or the corresponding portion of the proposed route would both temporarily increase turbidity levels in 3 large perennial streams, 2 of which are classified by the DEQ (all Class II).

Beulah Belle Lake Alternative. Construction of this alternative would temporarily increase turbidity levels in 4 large perennial streams, 3 of which are classified by the DEQ (all Class II), versus 3 large perennial streams, 2 of which are classified by the DEQ (all Class II), for the corresponding portion of the proposed route.

County Line Alternative. Construction of this alternative would temporarily increase turbidity levels in 6 large perennial streams, 4 of which are classified by the DEQ (3-Class II, 1-Class IV), versus 3 large perennial streams, 2 of which are classified by the DEQ (all Class II), for the corresponding portion of the proposed route.

Emigrant Gap Alternative. Construction of this alternative route or the corresponding portion of the proposed route would both increase turbidity levels in 1 large perennial stream which is classified by the DEQ (Class IV).

Accident During Operation

Proposed Route. A leak or major rupture of the pipeline could result in the release of oil or condensate into ground and/or surface waters. The pour point (that is, that temperature at which it changes from a solid to a liquid) of the condensate is very low (5°F) so that it would act as a liquid under most conditions. However, there are some winter days when air temperatures are less than 5°F for part or all of the day. During these periods condensate spilled on the surface may act like a solid. Condensate released into the pipeline trench or directly into a stream from pipeline rupture directly beneath the channel would act like a liquid. Because the pour point of the oil is higher (40°F), it would act like a solid when exposed to the colder temperatures characteristic of Wyoming winters. Oil released into a pipeline trench or into a stream from a rupture directly beneath the stream channel would also tend to act like a solid during the winter months. During warmer months, oil spilled on the ground, into the pipeline trench, or directly or indirectly into a stream would act like a liquid.

The potential impacts of a spill consequently depend highly upon the season. Oil spills during the winter months would have little or no ground- or surface-water quality effect because the oil would tend to be solid and relatively immobile. The potential fate of a spill of condensate onto a frozen or ice-covered river would be more of a problem because of the low pour point of the condensate. If the spill occurred on top of the ice, the fate of the condensate would be much like that of a terrestrial spill.

The fate of spills on land are primarily controlled by topography, and temperature. Temperature controls the viscosity of the fluid and thus the rate the fluid travels over any given slope. As mentioned previously, at temperatures below the pour point of the condensate, which occur during Wyoming winters, the condensate would tend to behave like a solid and be relatively immobile. During warmer winter days, condensate spilled onto a frozen river could reach the water through cracks or fissues in the ice-cover.

During the winter, the rate of evaporation of volatile components from spilled oil or condensate would be slow. Unless remedial actions were taken, oil and condensate spills on land are likely to slowly infiltrate into underlying soils. Because of its higher pour point, oil spills on ice covered streams are likely to persist longer than condensate spills and consequently have less potential for a floating surface-water quality.

If the condensate was lost from a buried pipeline directly underneath a frozen stream, the primary determinant of condensate fate would be the quality of downstream ice. After a rupture or spill, the condensate would tend to be trapped between the ice and water as a liquid because the water temperature would be about 32°F. If the downstream ice provided complete surface coverage, the rate of removal of the condensate from the waterbody would be reduced, primarily because the evaporation rate under ice is reduced. However, as the downstream surface ice layer is not expected to be complete, evaporation losses through surface fissures and open-water areas are expected to occur. In general, the layer of condensate trapped between the ice and water would move downstream at a rate somewhat slower than the mean current velocity, because of frictional effects between ice and water. Only in open water areas would the spill move downstream with the current.

Although a complete characterization of the condensate is not currently available, it is likely that it will contain compounds of interest from both public health and aquatic toxicity standpoints. These compounds would include benzene, toluene, ethyl benzene, xylenes, napthalene, 2-methyl napthalene, 1-methyl napthalene, dimethyl naphthalene, and trimethyl napthalene.

During the warmer months, terrestrial spills reaching the ground surface would tend to spread out along the land surface, the extent and direction of spreading depending primarily on vegetation and topography. Some of the spilled material would evaporate and some would infiltrate into the underlying soil. Less infiltration occurs in compact soils and more evaporation occurs when temperatures are high and condensates are spilled. Once in the soil, the hydrocarbons would move under the force of gravity toward the unconfined water table or underlying impermeable barriers. The lighter and more soluble components are most likely to reach groundwater, as the heavier weight compounds are likely to bind with soil particles. Once in groundwater, the soluble components would move slowly away from the spill site under the influence of the piezometric surface. The Oil Spill Analysis Technical Report contains a detailed discussion of the above discussion. In summary, terrestrial spills of liquid hydrocarbons can degrade underlying soils and groundwater. However, the extent of contamination is usually limited so that remedial actions (e.g., removal of contaminated soil and groundwater pumping and treatment), if necessary, can be effective.

During the warmer open-water season, spills of oil or condensate would result in a surface film moving downstream at about the same rate as the current. In this mode, evaporation would remove most of the lighter components present in the oil. An estimated 25 to 50 percent of the oil could be evaporated within the first few hours. It is expected that the condensate would evaporate at an even greater rate. Some oil or condensate would dissolve and some oil (and probably less condensate) would be entrained by shoreline features, although it is estimated that the rate of evaporation may be as high as 100 times the rate of dissolution. When the spill is detected, the movement of oil downstream can be halted; the dissolved material would move downstream, but would tend to evaporate as the lighter more volatile components are also the most soluble.

Refer to Chapter One (Section 1.3, Ruptures and Emergency Procedures) for oil spill mitigation measures that the applicant has committed to.

Alternative Routes. The effects of spills along the Beef Gap, Beulah Belle Lake, County Line, and Emigrant Gap alternatives would be similar to the effects of spills along the proposed route. The potential effects of a spill into the Sweetwater River near Pathfinder Reservoir (County Line Alternative) are discussed in the Oil Spill Analysis Technical Report.

100-YEAR FLOODPLAINS

Executive Order 11988 requires that federal agencies give special consideration to avoiding siting facilities in areas that can be damaged by floodwaters within a 100-year floodplain. The proposed and alternative pipeline routes cross the floodplains of numerous rivers. Based upon Department of the Interior stipulations for stream and floodplain crossings, the depth of the channel would be established by appropriate field investigations and theoretical calculations using combinations of water velocity and depth that yield the maximum value. At the point of maximum scour, the cover over the pipe would be at least 20 percent of the computed scour, but not less than 4 feet. The applicant proposes to use 5 feet of cover; therefore, no detailed analysis of potential pipe failure due to flood scour was done.

A portion of the proposed 3/4 Point pump station location is within a 100-year floodplain. Prior to construction, this pump station location would be examined by the applicant with respect to the estimated 100-year flood level, and this information would be used in the final design.

SOCIAL AND ECONOMIC CONDITIONS

Construction

In order to provide a "worst-case" analysis of potential project impacts, it is assumed that all of the construction workers employed on the four spreads would be non-local. In addition, it is assumed that 25 percent of these 430 to 560 workers would bring an average of 1.5 dependents with them. This would result in a total of about 592-770 temporary new residents in the study region during construction.

It should be noted that if the rate of unemployment in Casper and Rawlins, as well as in Fremont County, continues to rise as it has since 1979, it is likely that some of the jobs would be filled by local hires.

The potential social and economic impacts associated with a project of this size would be almost negligible in the affected communities under stable conditions. Some of the communities within the region, however, are still experiencing strains on community facilities and services as a result of recent rapid growth and development. The cumulative effects of simultaneous resource development projects would aggravate current shortages of local labor and housing in Green River, Rock Springs, and Evanston. The additional demand (refer to Table 3-3) for construction worker temporary housing in those communities, therefore, would be considered a significant impact. Even a relatively small pipeline construction crew could have difficulty finding temporary housing in some of these communities.

Rawlins and Casper, on the other hand, would be able to supply needed facilities and services during the construction phase of the project. It is also possible that some of the excess temporary housing currently available in Granger and Jeffrey City would be used, although no significant impacts were identified for those communities.

Potential socioeconomic impacts associated with construction of the proposed action would not change if any of the alternative routes were selected.

Operation

No significant impacts to community infrastructure or services would occur during the operation phase. Counties in the affected region would benefit from increased annual property tax revenues during project operation. For example, total tax revenues are projected to be approximately $152,000 in 1983, $164,000 in 1985,

Table 3-3. ESTIMATED TEMPORARY POPULATION INCREASE RESULTING FROM THE PROPOSED ACTION OR ALTERNATIVES COMPARED TO RENTAL HOUSING VACANCY RATES BY AFFECTED COMMUNITY, 1983

Community	Project-Related Population Increase[a]	Percent Increase to 1983 Projected Populations[a]	Rental Vacancy Percentage Rates/ Available Units
Evanston	138 - 172	1.0 - 1.2	0/0
Green River	249 - 342	1.7 - 2.3	2.0/85
Rock Springs	249 - 342	1.1 - 1.6	0.5-1.0/38-75
Rawlins	290 - 372	2.1 - 2.7	10.0/422
Casper	290 - 372	0.5 - 0.7	6.0/1216

[a] These figures represent a "worst case" analysis, i.e., construction workers and their families would reside in each community for 4-6 months.

and $183,000 by 1987. Tax revenues would continue to be received over the life of the project.

RECREATION RESOURCES

No significant impacts to nonurban recreation resources would result from the construction and operation of the proposed action or alternatives. The proposed and alternative pipeline routes do not traverse any developed nonurban recreation sites and there are a number of nonurban recreation resources which the small temporary construction work force could use. Additionally, the temporary construction work force would not use public campgrounds for temporary housing (refer to the Applicant Mitigation section in Chapter One).

The proposed or alternative pipeline rights-of-way might provide new and improved access for ORV use (e.g., Red Desert). Although this would have a positive impact on ORV recreation use, it might also have negative impacts on sightseeing, revegetation efforts, and other resources.

The expansion of urban recreation facilities has not kept up with the increase in demand in three of the potentially affected communities. Rock Springs, Green River, and Evanston are all experiencing a shortage of local recreation facilities. During the summer months, softball fields in these communities are all used to capacity.

The impact of construction workers associated with the proposed action or alternatives on urban recreation facilities would not be significant. Crews would probably work six ten-hour days per week, and therefore would have little leisure time to spend in the communities.

Potential impacts to nonurban and urban recreation resources which are associated with construction of the proposed action would not change if any of the alternative routes are selected.

WILDERNESS VALUES

No consequences which would impair the wilderness characteristics of the eleven WSAs in the study area were identified for the proposed action or alternatives. Interim management guidelines for these study areas would not be violated if the proposed action or alternatives were implemented.

VISUAL RESOURCES

The analysis of consequences was based on the BLM Visual Resource Management System for inventorying and evaluating visual resources, and for detemining the degree of landscape constrast resulting from project development (see BLM manual 8423 for a description of this procedure). Adverse visual consequences occur where the proposed action or alternatives would significantly contrast with existing landscape features (line, form, texture, and color).

Visual management classes, delineating visual quality, sensitivity and viewing distance for all landscapes traversed by the proposed and alternative routes, were used as the basis for the contrast assessment. The use of revegetation, construction, and restoration methods were considered in the analysis, as well as access to the view, angle of observation, and duration of the view. The contrast evaluation was primarily concerned with residual effects of construction activities, such as surface scars and structures (pump stations).

Some sections of the proposed route parallel existing pipelines and roadways where visual contrasts are already evident, thus reducing the quality of the landscape. Contrasts resulting from the proposed route would be less significant in these settings than in unmarred landscapes; however, in particulary sensitive landscapes (such as canyons, valleys, and along exposed ridges) the cumulative effects are considered significant.

Pipeline construction removes vegetation, disturbs existing topographic features, and in some instances creates new drainage patterns. The effect of these activities most frequently results in the introduction of an unnatural line (the ROW) across the landscape, which contrasts noticeably with the existing landscape features. Some contrasts relating to vegetation removal are temporary because they are in areas conducive to revegetation within one to two growing seasons. These are considered insignificant unless they occur in pristine (VRM Class I) landscapes (of which there are none in this project environment).

Other landscape features would not recover so easily or quickly, and the visual contrast would remain for a longer period of time (over 2 years) and could result in significant visual consequences. Longer-term contrasts frequently occur in landscapes slow to revegetate, rocky and steep-sloping terrain that are difficult to restore, and in unstable soils, such as sand dunes.

Visual consequences identified for the proposed and alternative routes are provided in Table 3-4. Visual consequences would be considered significant for three areas along the proposed route: White Mountain Petroglyphs area (MP 110-114); the Red Desert area (MP 150-180); and the U.T. Gap area (MP 217-230). No significant visual consequences were identified for any of the alternative routes.

CULTURAL RESOURCES

As mentioned in Chapter Two, a BLM Class I cultural resource overview was prepared to provide information for this document. The number of known sites described in Chapter Two represents an overview of previous work only. Prior to construction, a BLM Class III field survey would be undertaken for a 200-foot width centered on the pipeline right-of-way. The purpose of this survey will be to locate

Table 3-4. VISUAL CONSEQUENCES

Route[a]	Visual Consequence
Proposed Route	
MP 12-14	Clearing of vegetation in the riparion zone on either side of the Bear River crossing would result in temporary visual contrasts in color and texture until revegetation takes place. Contrasts would be within BLM VRM limits.
MP 86-88	Visual consequences similar to those just described for the Bear River crossing also apply to the Green River crossing. Sensitivity is high along this river during summer months because of heavy recreational use for float boating and fishing.
MP 110-114	The ROW crosses the White Mountain rim and passes within two miles of the set of Indian drawings known as the White Mountain Petroglyphs (Sec. 11, T22N, R105W). Visual contrasts in line and color resulting from soils disturbance could be visible from this historic and educational site. Human intrusions in the landscape scene surrounding the petroglyphs would significantly effect the natural setting of value to the visual context of the site. Visual contrasts in the element of line would exceed BLM VRM objectives for this landscape, and would be considered significant.
MP 150-180	The segment crossing the Red Desert would result in noticeable visual contrasts in line and color as soils are disturbed during pipeline construction activities. Maximum element contrast suggested for this landscape class is 2X; however, the unnatural line introduced by disturbed soils would result in short-term visual contrasts which exceed the degree of contrast by 3X (strong). This impact would be considered significant.

Table 3-4. VISUAL CONSEQUENCES (continued)

Route[a]	Visual Consequence
Proposed Route (continued)	
MP 196	Visual contrasts in line, color, and texture resulting from removal of vegetation and disturbance to soils during the construction phase that would be visible from the proposed Continental Divide National Scenic Trail could affect the quality of the scenic experience for trail users. Since this crossing is located in an area where other natural scenic resources also exist (Green Mountain, Crooks Mountain), sensitivity is potentially high. Existing human intrusions from uranium mining activities reduce the extent of contrast resulting from pipeline construction. Contrasts would meet BLM VRM objectives.
MP 215-217[b]	This segment crosses on the south side of the public viewing area (BLM Interpretive Site) and thus avoids the primary scenic-historic portion of the landscape in the Split Rock Viewing Area. Portions of cleared ROW may be visible from recreation sites (picnic tables, trails) on the western side of the developed visitor area, however, the visual contrasts from human intrusions are already visible from these vantage points (an existing pipeline and roadway); thus impacts would be cumulative. This portion would meet BLM VRM objectives.
MP 217-230[b]	Removal of grasses and sagebrush, and disturbance to soils would result in noticeable visual contrasts (line, color, texture) through the U.T. Gap landscape. This area is currently undisturbed (except for a seldom used 2 track road). Public use of the adjoining Sweetwater Rock WSAs is low because access is limited to entry over private land. Visual contrasts would exceed BLM VRM objectives in line, color and texture in this primarily natural area, and would be sensitive if public use of adjoining WSAs were to develop. These visual contrasts would be considered significant.

Table 3-4. VISUAL CONSEQUENCES (concluded)

Route[a]	Visual Consequence
Beef Gap Alternative	
MP 0-15	This alternative stays south of the public viewing area (BLM Interpretative Site) and thus avoids the scenic-historic portion of the landscape in the Split Rock Viewing Area. Portions of cleared ROW would be visible from recreation sites (picnic tables, trails) on the western side of the developed visitor area and as it passes through the Sweetwater Rocks in Beef Gap; however, the visual contrasts are consistent with other signs of human intrusions also visible from these vantage points (an existing pipeline and roadway). This portion would meet BLM VRM objectives.
Beulah Belle Lake Alternative	
MP 0-15	Visual impacts are generally the same as for the Beef Gap Alternative described above.
County Line Alternative	
MP 15-25	Though this portion traverses the southern portion of the historic Devils Gate BLM Interpretive Site and passes by historic Independence Rock, it generally follows an existing linear development (State Highway 220) and would meet BLM VRM objectives for the area.

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[a] No significant visual consequences were identified for the Emigrant Gap Alternative or the corresponding portion of the proposed route.

[b] These portions of the proposed route correspond to the Beef Gap, Beulah Belle Lake, and County Line alternatives.

previously unknown cultural resource sites. A Historic Preservation Process Memorandum of Agreement between the Bureau of Land Management, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer is being prepared to outline procedures and methods to identify, evaluate, and protect cultural resources on or eligible for inclusion on the National Register of Historic Places. All known eligible resources and those identified as eligible during the field inventory would be avoided where practical. Impacts to resources which are not prudently or feasibly avoidable would be mitigated according to the provisions of the Memorandum of Agreement. Therefore no known cultural resource sites would be adversely impacted by the proposed action.

3.3 ENERGY USE

An energy-use balance calculation was made for the proposed action and alternative routes. This calculation considered the total energy use for pipeline construction, operation, and maintenance and the total energy transported by the pipeline. The estimated energy use for the proposed action is 0.1 percent of the energy which would be transported by the proposed pipeline. Energy use for the alternative routes would not differ substantially from that for the proposed action. The detailed analyses of energy-use balance are provided in the Energy Use Technical Report.

3.4 UNAVOIDABLE ADVERSE IMPACTS

The following discussions address adverse environmental effects which cannot be avoided should the proposal be implemented.

AQUATIC BIOLOGY

Various aquatic biological impacts resulting from instream construction activity, including the direct and indirect effects of turbidity/siltation and habitat disturbance, are unavoidable if the "trench-and-fill" technique is used. Nevertheless, these impacts are considered to be localized, short-term, and insignificant.

PALEONTOLOGY

Subsurface fossils may be damaged or destroyed during construction activities.

SOCIAL AND ECONOMIC CONDITIONS

During pipeline construction, the proposed action or alternatives would contribute to the existing housing shortages and future cumulative impacts on housing and community services in the communities of Evanston, Green River, and Rock Springs.

RECREATION RESOURCES

During pipeline construction, the proposed action would contribute to the existing impacts on urban recreation facilities in Rock Springs, Green River, and Evanston.

VISUAL RESOURCES

Visual contrasts from pipeline construction activities, resulting from removal of vegetation and disturbance to soils in this semi-arid region, are unavoidable in areas where viewing points provide open or expansive perspectives of disturbed landscapes.

CULTURAL RESOURCES

Construction activities may alter, damage, or destroy unknown subsurface cultural resource sites and result in disturbance to, or loss of, horizontal and vertical subsurface cultural information. Mixing and loss of artifacts and stratigraphic data could also occur.

ENERGY USE

Construction and operation of the proposed action or alternatives would require about 0.1 percent of the potential energy transported.

3.5 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE AFFECTED ENVIRONMENT AND THE LONG-TERM PRODUCTIVITY

The following discussions address the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

VEGETATION

The clearing of existing vegetation on any areas which could not be revegetated to predisturbance conditions of density, cover, and height would constitute a long-term productivity loss for the vegetation resource.

WILDLIFE

Direct and indirect mortality of adult animals, young, and eggs in nests and habitat modification could cause long-term productivity losses for these wildlife resources. However, because of the capability of animal populations to recover to preexisting levels through reproduction and the capability of disturbed vegetative habitats to recover through reseeding and secondary natural succession, most wildlife resource productivity losses would be short-term.

PALEONTOLOGY

Bedrock disturbance may lead to the recovery of fossils that would not otherwise have been discovered. The scientific value of these fossils may be sharply diminished, however, by damage sustained during this disturbance.

VISUAL RESOURCES

Modification of scenic resources (particularly those with scenic and historic relevance) where reclamation is not possible or successful would constitute a long-term diminishment of the quality of this resource.

CULTURAL RESOURCES

Some cultural information could be lost during the construction of the pipeline. Beneficial impacts which could result from the project are the location and data recovery of previously unknown cultural resource sites during the Class III field survey. However, short-term use could eliminate long-term benefits of preservation and any opportunity for future studies.

3.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The following discussions address any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

PALEONTOLOGY

Significant fossils may be permanently damaged or destroyed during construction, maintenance, or repair.

SOILS

In any disturbed areas where reclamation/revegetation efforts were unsuccessful, loss of productive soil surface layers from accelerated soil erosion would constitute an irreversible and irretrievable commitment of the soil resource.

CULTURAL RESOURCES

Some sites may be permanently damaged or destroyed during construction, maintenance, or repair.

CHAPTER FOUR
CONSULTATION AND COORDINATION

4.1 THE SCOPING PROCESS

The Council on Environmental Quality's Final Regulations for Implementing the National Environmental Policy Act (40 CFR, Part 1501.7) require an early and open scoping process prior to initiating an Environmental Impact Statement. The principal purpose of the process is to identify the pertinent issues associated with the proposed action in order to develop and limit the scope of the EIS.

An additional purpose of the scoping process is to inform potentially affected federal, state and local agencies and other interested persons and organizations about the proposal. This is intended to allow and encourage public involvement and input to the impact assessment process before an EIS is begun, and to help direct the analysis from the outset so that the EIS is focused on important issues early enough to:

- Avoid unnecessary data collection and assessment
- Develop an adequate set of alternatives
- Develop criteria for the agencies' preferred alternative
- Reduce the size of environmental documents wherever practicable

SCOPING MEETINGS

An initial mailing list of over 800 names was used to distribute information about the proposed Frontier Pipeline Company project and to inform the public about planned scoping meetings. In addition, the public scoping meetings were announced in the Federal Register, news releases, and radio spots. A total of six scoping meetings were held in February, 1982 (see Table 4-1). Public scoping meetings were held in Evanston, Rock Springs, Rawlins, and Casper, Wyoming. Agency scoping meetings were also held in Cheyenne, Wyoming, to facilitate involvement by state and federal agencies. A detailed summary for each meeting, attendance lists, written comments solicited during the meetings, and a public announcement record is on file with the BLM District Office in Rawlins, Wyoming. A brief summary of each meeting follows. No public or agency scoping meetings were held in Utah because the proposed pipeline was not extended into Utah until July, 1982 (five months after scoping meetings were held).

Cheyenne, Wyoming: February 3, 1982

This scoping meeting was held for federal agencies. Three representatives of federal agencies, including the Army Corps of Engineers, Bureau of Reclamation, and Fish and Wildlife Service, attended the scoping meeting. The main concerns focused on the permits required, the evaluation of stream crossings and migratory bird protection, and reclamation of disturbed land.

Cheyenne, Wyoming: February 4, 1982

This meeting was attended by eight representatives of Wyoming state agencies including the Department of Game and Fish, Industrial Siting Commission, Public Service Commission, State Historic Preservation Office, State Planning Coordinator, and the Water Development Commission. The discussion focused on necessary

Table 4-1. SCOPING MEETINGS

Date	Meeting Held With	Location
February 3, 1982	Federal Agencies	Cheyenne, Wyoming
February 4, 1982	State Agencies	Cheyenne, Wyoming
February 8, 1982	Public	Evanston, Wyoming
February 9, 1982	Public	Rock Springs, Wyoming
February 10, 1982	Public	Rawlins, Wyoming
February 11, 1982	Public	Casper, Wyoming

applications and surveys to be conducted. The Wyoming Department of Game and Fish expressed concern about disturbance to bald eagle habitat, black-footed ferrets, and big-game winter range. Concerns were also expressed, by both the Wyoming Department of Game and Fish and the Wyoming State Historic Preservaton Office, over the impacts to the sand dune areas traversed by the proposed action. These areas are considered to be biologically fragile and may contain many prehistoric sites.

Evanston, Wyoming: February 8, 1982

No major concerns were raised in this public meeting. Questions regarding the construction work force size and where workers would reside were asked. General questions about the construction timetable and the status of lands (in terms of ownership) traversed by the pipeline were also asked.

Rock Springs, Wyoming: February 9, 1982

During this public meeting support for efforts to follow existing pipelines was expressed in terms of a desire to reduce soil erosion and potential disruption to vegetation. A request was made for a long-term committment to revegetation along the right-of-way. Concern was expressed over potential impacts to sensitive wildlife species and their habitats, i.e. raptor nesting areas, and elk herd in Red Desert. It was suggested that alternate river crossing methods (e.g., suspend over) be analyzed for the Green, Sweetwater, and Bear rivers.

Concern was expressed over lack of temporary housing for project construction work force in Rock Springs and Evanston. There is currently a shortage of temporary accomodations in these areas. In addition, concerns were expressed about squatters and trespassing, including enforcement capacities of local governments. There was also a request that no firearms be kept in company vehicles while on the job. Concerns were also expressed about impacts to trails in the region (e.g. Continental Divide National Scenic Trail and Oregon-Mormon National Historic Trail).

Rawlins, Wyoming: February 10, 1982

The discussion focused on three issues: concern over reclamation of disturbed areas, potential conflicts with Known Recoverable Coal Resource Areas (KRCRAs) and other potential coal areas which are not designated yet, and utilization of existing or proposed utility corridors (to minimize conflicts with resources).

Casper, Wyoming: February 11, 1982

Two issues were raised at this meeting: minimizing disturbance to the Red Desert, and avoiding the Fourteen-Mile Ranch (located north of Rock Springs). If the pipeline would go over White Mountain, the owner of Fourteen-Mile Ranch requests flood control measures to protect his lands.

LOCAL PLANNING AGENCY MEETINGS

Evanston Meeting

On February 8, 1982, representatives of the BLM and Woodward-Clyde Consultants met with Mr. Harold Young (Evanston City Planner) and Mr. Dennis Farley (Uinta County Planning Director). The main concern of these planners in regard to the proposed Frontier project is the shortage of housing in the area (e.g., for temporary construction work force). Both planners stated they would like construction workers to be housed at existing work camps if possible.

Rock Springs Meeting

On February 9 1982, representatives of the BLM, Frontier Pipeline Company, and Woodward-Clyde Consultants met Mr. Richard Unger (Rock Springs City Planner). The concerns expressed by Mr. Unger were:

- Potential temporary work force accomodation problems (e.g., construction workers living in trailers on open range, grocery store lots, etc.) and the associated image and enforcement problems for the city.

- Overloading capacity of urban recreation areas (already overloaded and misused).

- Potential stressing of social services (e.g., mental health and police).

Green River Meeting

On February 9, 1982, representatives of the BLM, Frontier Pipeline Company, and Woodward-Clyde Consultants met with Mr. Dennis Watt (Sweetwater County Planner). Mr. Watt expressed the following concerns:

- Lack of available housing for construction work force.

- Problem with utility corridor concept as it applies to Interstate 80. Mr. Watt said they do not want anymore pipelines along I-80, due to the pressure for residential and commercial development along I-80 in Sweetwater County.

- Pipeline may go through the corporate boundaries of Granger.

- Anticipates problems with Grazing Association (e.g., concerned about servicing access roads, ORV use/access,and fence cutting).

- Potential conflict with Ice Caves in the Natural Corrals area, which is a proposed Area of Critical Environmental Concern.

Rawlins Meeting

On February 10, 1982, representatives of Frontier Pipeline Company and Woodward-Clyde Consultants met with Mr. David Spencer (Rawlins City Planner) and Mr. Lance Stewart (Carbon County Planner). These planners were concerned about the potential impact on Rawlins population from the construction/operation work forces.

WRITTEN COMMENTS

In addition to the above described meetings, written comments responding to the scoping announcements were received. These comments were summarized as follows:

- Archaeological and historical walkover of the route
- T/E species, riparian, wetland habitats
- Reclamation/revegetation of lands, including privately owned
- Control of and need for construction housing
- Use of existing utility ROW
- Minimize soil disturbance and erosion
- Impacts on National Historic Trails, parks
- Minimize impacts at river and highway crossings
- Effects on mineral resource development
- Effects on wild horses and wildlife habitats
- Effects to Red Desert
- Engineering of the pipeline should be carefully checked
- Impacts on Allied, FMC, and Stauffer trona operations

4.2 PREPARERS

Name: Martin A. Cramer
Position: Oil Spill Analysis Task Leader
Education: B.S. Conservation of Natural Resources
Experience: 5 years

Name: Marilyn Duffey-Armstrong
Position: Visual Resource Task Leader
Education: B.S. Industrial Design, M.S. Cybernetic Systems
Experience: 10 years

Name: Mara Feeney
Position: Social and Economic Conditions Task Leader
Education: B.A. Anthropology, M.A. Community and Regional Planning
Experience: 6 years

Name: Perry H. Fontana
Position: Climate, Air Quality, Noise and Energy Use Task Leader
Education: B.A. and M.A. Meteorology
Experience: 4 years

Name: Gary Kaufman
Position: Water Quality Task Leader
Education: B.S. Environmental Engineering, M.S. Environmental Engineering, Ph.D. Candidate Environmental Engineering
Experience: 9 years

Name: Stephen Ko
Position: Project Manager
Education: M.S. Civil Engineering, Ph.D. Civil Engineering, M.B.A. Finance/Planning
Experience: 18 years

Name: Eugene Mancini
Position: Aquatic Biology Task Leader
Education: A.B. Biology, M.A. Zoology, Ph.D. Biology
Experience: 12 years

Name: Scott Moorhouse
Position: Vegetation and Wildlife Task Leader
Education: B.S. Biology, M.S. Environmental Biology
Experience: 9 years

Name: Carolyn Nader
Position: Soils, Prime Farmland, and Livestock Grazing Task Leader
Education: B.S. Agriculture
Experience: 3 years

Name: Roseanne Perman
Position: Paleontology Task Leader
Education: B.A. Geography and Earth Sciences
Experience: 5 years

Name: Brenda Peters
Position: Recreation and Wilderness Resources Task Leader
Education: B.A. Environmental Studies and Sociology
Experience: 1 year

Name: Robert L. Ray
Position: Assistant Project Manager
Education: B.S. Natural Resources Management
Experience: 4 years

Name: Alvils D. Renga
Position: Geologic Hazards and Mineral Resources Task Leader
Education: B.S. Geology
Experience: 19 years

Name: T. Reid Farmer (Commonwealth Associates Inc.)
Position: Cultural Resources Task Leader
Education: M.A. Anthropology
Experience: 9 years

Firm: Environmental Research and Technology (contractor to Frontier Pipeline Company)
Responsibility: Appendix D (statements of impact significance provided by Woodward-Clyde Consultants)

Firm: Powers Elevation Company (contractor to Frontier Pipeline Company)
Responsibility: Paleontological Field Inventory

4.3 BLM REVIEWERS

Rawlins District Office
- Divide Resource Area
- Lander Resource Area

Casper District Office
- Platte River Resource Area

Rock Springs District Office
- Big Sandy Resource Area
- Kemmerer Resource Area
- Salt Wells Resource Area

4.4 AGENCIES CONSULTED

Carbon County
- Planning Office
- Sheriff's Office
- Office of the Treasurer

Casper
- Board of Public Utilities
- City Parks Department
- Planning Office
- Police Department

- Chamber of Commerce
  - Casper
  - Evanston
  - Rawlins

- Department of Agriculture
  - Soil Conservation Service
    - Casper
    - Evanston
    - Lander
    - Rawlins
    - Riverton
    - Rock Springs

- Department of Defense
  - U.S. Army Corps of Engineers
    - Grand Junction, CO
    - Sacramento, CA
    - Omaha, NB

- Department of the Interior
  - Bureau of Land Management
    - Rawlins District Office
      - Divide Resource Area
      - Lander Resource Area
    - Casper District Office
      - Platte River Resource Area
    - Rock Springs District Office
      - Big Sandy Resource Area
      - Kemmerer Resource Area
      - Salt Wells Resource Area
  - Geological Survey
    - Water Resources Division
      - Casper
      - Cheyenne

        Green River
        Logan, UT
    Fish and Wildlife Service, Billings, MT

Environmental Protection Agency
    Region IX Office, San Francisco, CA

Evanston, Wyoming
    City Clerk's Office
    Planning Office
    Police Department

Fremont County
    Planning Office
    Sheriff's Office
    Office of the Treasurer

Granger, Wyoming
    City Hall

Green River
    City Hall
    City Planning Office
    Parks and Recreation Office
    Police Department

Natrona County
    Office of the Treasurer

Rawlins
    City Planning Office
    Police Department

Rock Springs
- City Clerk's Office
- City Planning Office
- Police Department
- Recreation Department

Sweetwater County
- Planning Office
- Office of the Treasurer

Uinta County
- Planning Office
- Office of the Treasurer

Universities
- University of California, Berkeley, CA
- University of Wyoming, Laramie, WY

Utah State
- Department of Health
  - Bureau of Water Pollution Control
- Division of Water Rights

Wyoming State
- Cooperative Fishery and Wildlife Research Unit
- Department of Administration and Fiscal Control
- Department of Environmental Quality
- Department of Revenue and Taxation
- Employment Security Commission
- Game and Fish Offices
  - Cheyenne
  - Green River
  - Lander
- Geological Survey
- Highway Department

APPENDIX A

FRAMEWORKS FOR ANALYSIS

The following indicators of impact significance were used to determine impact topics warranting detailed analysis and to focus on necessary and relative levels of effort required for analyses. They were based on the draft project description, the scoping process, and professional judgment. Refer to the individual technical reports for more detail.

VEGETATION

In order to quantify impacts of construction and objectively determine impact significance, the area of each major vegetation type which would be disturbed by construction of the pipeline and ancillary facilities on the proposed and alternative routes was compared to the total area of the vegetation type in a larger area. The larger areas were designated geographic area units (units) and are large, continuous, and homogeneous areas of major vegetation types which are crossed by the proposed or alternative routes. Five units were delineated.

The area of disturbance of each major vegetation type in each unit which would be caused by the complete clearing of the 100-foot-wide pipeline ROW, and the pump stations, was calculated, divided by the total area of the vegetation type in the unit, and expressed as a percentage. An impact was considered significant if more than

0.50 percent of the total area of a vegetation type in a unit would be disturbed by construction.

The analysis of impacts to the riparian vegetation type was completed using a different technique because of the lack of detailed data on the distribution and areal extent of the riparian type in the affected area. Riparian vegetation in the affected area is usually distributed in narrow linear strands along rivers, streams, or canals. The width of specific stands of riparian vegetation at river crossings along the proposed and alternative routes was assumed to be 400 feet for major rivers, including the Bear River, Blacks Fork, and the Green River. The width of the area of riparian vegetation at the Sweetwater River crossing was assumed to be 300 feet. The width of the area of riparian vegetation along additional perennial streams was assumed to be 150 feet, 75 feet for intermittent streams, and 30 feet for canals. The area of riparian vegetation in a larger area around each crossing was defined as the area included in a 10 mile segment of the river, stream, or canal centered over the crossing. The width of the area of riparian vegetation in this 10 mile segment was assumed to be the same as the assumed width at the crossing point.

The area of riparian vegetation disturbed at each river and stream crossing was calculated as an area 200 feet wide (parallel to the river or stream) and 400 feet long (perpendicular to the river or stream). This is the size of the area described as a staging area in Chapter One. An impact was considered significant if more than 1.0 percent of the area of riparian vegetation type in the larger area would be disturbed.

LIVESTOCK GRAZING

Impacts to livestock grazing were considered significant if more than 0.5 percent of animal-unit months (AUMs) for a major vegetation type within a geographic area unit would be lost for a period of one year or more.

AQUATIC BIOLOGY

In all phases of aquatic biological impact analysis, emphasis was placed on fishes, macroinvertebrates, and sensitive classification species. Other components of the freshwater community including phytoplankton, zooplankton, periphyton, and vascular plants were considered only in the few situations where anticipated impacts would significantly affect their populations. The high and rapid reproductive potential of plankton and periphyton populations was considered to make them resistant to both short- and long-term construction and operation impacts. Vascular plants could be affected by direct removal from riverbeds during construction of the pipeline but it is anticipated that, generally, these impacts would not significantly affect the population.

The significance of aquatic biological impacts included a consideration of the extent to which physicochemical habit parameters would be expected to be altered by project construction, operation, maintenance, or abandonment procedures. Impacts were considered significant when they would be long-term and were anticipated to kill or displace numerous fishes or macroinvertebrates (whether or not they were sensitive classification species) as a direct or indirect result of project activities. Long-term impacts were considered to be those biological disturbances that would be detectable for more than one year, and would be expected to affect more than one generation of established populations. An attempt was made, where possible, to estimate the period of time required for biological recovery from identified impacts.

Short-term and/or insignificant impacts were considered to be biological disturbances which would be detectable for a period of one year, or less, and would be anticipated to affect only one generation (year-class) of established populations.

WILDLIFE

In order to quantify wildlife impacts and objectively determine impact significance, the area (size) of each area of big-game crucial winter or crucial winter/yearlong range and sage grouse wintering area which would be disturbed by construction of the pipeline and pump stations on the proposed and alternative routes was compared to the total area (size) of the important area and established as a percentage. It was assumed that the entire 100-foot-wide ROW would be cleared of vegetation. An impact was considered significant if greater than 1.0 percent of the total area of an important area would be disturbed by construction activities.

The significance of construction (clearing) impacts to riparian habitats was determined using the same methods as described for the riparian vegetation type under Vegetation in this appendix.

GEOLOGIC HAZARDS

Geologic hazards were reviewed using the following indicators of hazard significance:

- Hazards were considered significant if the proposed action or alternatives would be located both on known active faults and areas where the estimated expected horizontal acceleration figures for the affected areas indicated a reasonably high probability of earthquake-induced ruptures.

- Hazards were considered significant if the proposed action or alternatives would be located in landslide-prone area for which special design and engineering practices would be insufficient to reduce potential risk of rupture to a low probability.

- Hazards were considered significant if the pipeline would be buried in areas with soils highly susceptible to shrink-swell for which special design and engineering practices would be insufficient to reduce risk of rupture to a low potential.

- Hazards were considered significant if the proposed action or alternatives would be located in an area with potential for subsidence or mine collapse for which careful project routing and design would be insufficient to reduce risk of rupture.

MINERAL RESOURCES

Impacts were considered significant if the proposed action or alternatives would conflict with the use of mineral resources for which there are formal development plans or formally filed applications.

PALEONTOLOGY

Assessments of the paleontological resources must be based on the scientific or educational significance of the fossils, and the sensitivity to project-related disturbance of the area in which they are found. There is presently no widely accepted definition of significance for paleontological resources. However, in a 1978 BLM

Instruction Memorandum, defining criteria for coal development were suggested. Based on this memorandum, a fossil is considered significant in this study if it fulfills any of the following criteria:

- It provides important information on the evolutionary trends in organisms, relating living inhabitants of the earth to extinct organisms or clarifying relationships among extinct organisms.
- It provides important information regarding development of biological communities, or interaction between botanical and zoological biotas.
- It demonstrates unusual or spectacular circumstances in the history of life.
- It is in short supply and in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and is not found in other geographic locations.
- It is a vertebrate fossil.

A fossil is not considered significant if it meets any of these criteria:

- It is of a species that occurs in large numbers throughout a large geographic area.
- It does not provide additional scientific data not found in other specimens of the same species.

The sensitivity of a particular area to disturbance is related to factors that include the significance of the fossils, their condition of preservation, and their abundance within the area. Geologic formations within the study area were assigned a sensitivity rating based on a classification scheme in which these factors were considered.

The classification consists of the following three categories of sensitivity:

- High Sensitivity: where abundant significant fossil assemblages or individual fossils have been recovered; or where there is a high probability that the proposed project would cause direct disturbance to material exposed at the surface, or interfere with the future recovery of potentially significant fossils.

- Moderate Sensitivity: where significant fossils are known to occur in low abundance; or where there is a moderate probability that development would result in direct disturbance to material exposed at the surface, or interfere with the future recovery of potentially significant fossils.

- Low Sensitivity: where fossils are extremely rare or only insignificant fossils are known to occur.

SOILS AND AGRICULTURE

Soils

Soils impacts would be considered significant if soil erosion was not held to acceptable levels and vegetative cover on disturbed areas was not reestablished at levels equivalent to the predisturbance condition within 5 years. "Acceptable level" is defined as that amount of soil loss which would not significantly affect the long-term use and stability of disturbed areas. The maximum acceptable rate of soil loss on arid and semiarid rangeland is considered to be two tons per acre per year, and on irrigated agricultural lands, five tons per acre per year.

Agriculture

Impacts to agriculture would be considered significant if less than 90 percent of disturbed agricultural areas were returned and maintained at their preconstruction level of productivity within four years.

PRIME FARMLAND

Impacts to Prime Farmland were considered significant if any Prime Farmland would be permanently removed from production by surface facilities associated with the proposed action or alternatives.

WATER RESOURCES

The analysis of potential impacts upon water resources includes four principal areas: stream crossings, hydrostatic test water consumption and discharge, 100-year floodplains, and ruptures and spills. The frameworks for analysis for the first three of these areas are as follows. The framework for analysis for ruptures and spills is covered in the Oil Spill Analysis Technical Report.

Stream Crossings

The proposed action and alternatives would cross numerous washes, creeks, streams, and rivers. Based upon the U.S. Geological Survey topographic maps (1:250,000 scale), these crossings can be classified as either intermittent or perennial waterways.

The temporary impact of stream crossing construction activities (i.e., potentially increased levels of suspended solids) was evaluated for construction operations at a generic or "typical" large perennial river crossing and a "typical" small perennial river crossing. Intermittent crossings were not evaluated because these creeks and washes would be crossed during dry periods of no flow. Estimated increases in levels of suspended solids at perennial river crossings were compared to recorded highest levels and water quality standards, where applicable, to determine significance.

The proposed construction plan would include erosion control procedures. Soil conditions at certain streambanks may warrant mitigation measures (refer to Applicant Mitigation section in Chapter One). Because erosion control has been incorporated as a mitigation feature, no quantification was made of long-term sediment generation along the disturbed pipeline corridor or delivery into nearby watercourses.

Hydrostatic Test Water Discharge

Hydrostatic test water would be diverted from surface water sources and could be discharged at numerous locations along the route. Temporary water rights and permits to appropriate surface waters for water use during construction must be obtained from the State Engineer. These permits require information on the location, use, and quantity of the diversion.

An NPDES permit is also required for hydrostatic test water discharge. This permit would be issued by the Wyoming Department of Environmental Quality for discharges in Wyoming, and by the EPA (Region VIII) for discharges in Utah. The regulatory requirements of these agencies were identified and will be met by the applicant.

100-Year Floodplains

Executive Order 11988 requires that federal agencies give special consideration to avoiding siting of facilities in areas that can be damaged by floodwaters within a 100-year floodplain. The pump stations would be sited, or elevated, to avoid 100-year floodplains. The pipeline would cross the floodplains of numerous rivers. The applicant has stated that stream crossings would be excavated to the depth that minimizes the effect of scouring action to the pipeline during periods of high flow. In general, water depth would be a minimum of five feet beneath the maximum scour depth. Department of Interior stipulations for stream and river crossings state that the depth of the channel would be established by appropriate field investigations and theoretical calculations using combinations of water velocity and depth that yield the maximum value. At the point of maximum scour (maximum scour depth elevation) the cover over the pipe would be at least 20 percent of the computed scour, but not less than four feet. Therefore, as the applicant is in general specifying a greater depth, no detailed analysis of potential pipe failure due to flood scour was done. Prior to construction, pump station locations would be examined by the applicant for their locations with respect to the 100-year floodplains for the proposed action and alternative crossings.

SOCIAL AND ECONOMIC CONDITIONS

For NEPA compliance, the Council on Environmental Quality requires that potential significant impacts (either beneficial or adverse) be identified. For the purpose of this impact assessment, certain "threshold" figures were selected to determine whether a projected impact would be significant. These threshold figures were based on each community's ability to respond to social and economic impacts associated with the Frontier proposed action and alternatives. Impacts were considered significant if the:

- projected annual population increase in existing communities would exceed 10 percent (except in Evanston and Rock Springs, where a 5 percent increase could be significant)

- projected annual increase in employment or income would exceed 10 percent

- county or community revenues would increase by 10 percent

- public sector jurisdictions would be unable to meet costs of providing necessary services and facilities to new population prior to receipt of project revenues

- demand for community services and facilities (housing, municipal services, human services, law enforcement, fire protection, recreation) would be in excess of projected availability

- the local private sector would not be able to respond to new demands for services and facilities not supplied by the public sector

- nuisance factors would result in uncompensated loss of property or livelihood

TRANSPORTATION NETWORK

Impacts were considered significant if traffic to the project area, consisting of commuters and trucks hauling equipment and pipe, would generate or add to traffic congestion (roadway capacity).

WILDERNESS

The indicators of impact significance are directly related to the criteria and guidelines for inventorying and managing wilderness study areas (WSAs). The basic criterion is whether any of the proposed or alternative project features would impair the naturalness of the WSAs; the opportunities for solitude or primitive and unconfined recreation; or ecological, geological, or other features of scientific, educational, scenic, or historical value.

RECREATION

Criteria for identifying significant nonurban and urban recreation impacts associated with project development included the following:

- The recreation resource would be permanently altered so that it no longer qualifies for recreation designation and protection by public agencies (e.g., wild, scenic, and recreational trails, rivers, and landmarks); or so it no longer provides a quality experience.

- Increased demand for recreation resources resulting from project work force, when distributed among recreation areas, would exceed the total number of facilities and resources available, or worsen existing and projected competition for resources.

VISUAL RESOURCES

Impacts to visual resources were considered significant if either of the following conditions were found:

- In VRM Class I areas, the degree of contrast for any one element would exceed a weak degree of contrast (1X), or the total contrast rating for any feature would exceed 10.

- In VRM Class II areas, changes to any of the basic elements (form, line, color or texture) would be evident for longer than one or two growing seasons, or exceeded a total contrast rating of 12 for any single feature.

- In VRM Class III areas, changes would not remain subordinate to the dominant features in the landscape, or would exceed a total rating of 16 for a single feature.

- In VRM Class IV areas, the total contrast rating for any feature would exceed 20.

CLIMATE, AIR QUALITY, AND NOISE

Climate

Impacts on climate would be considered significant if they would cause a measurable change in any climatic parameter (e.g., temperature, precipitation) on a scale larger than the microscale.

Air Quality

Determination of significance of air quality impacts was based on estimated pollutant emissions of volatile organic compounds associated with the crude oil storage tanks. Because fugitive dust emissions are associated only with the construction phase of the project and are therefore temporary, such impacts would not affect regional and/or long-term air quality, and would not be considered significant.

Estimated emission rates of volatile organic compounds were compared to *de minimis* levels presented in the Environmental Protection Agency's (EPA's) Prevention of Significant Deterioration regulations (40 CFR 52.21, as revised on August 7, 1980). The *de minimus* level for volatile organic compounds is 40 tons per year. Any pollutant emissions less than these limits would have insignificant impacts on air quality.

Since volatile organic compounds were not found to be emitted in an amount greater than 40 tons per year, an assessment of the effect of such emissions on ambient air quality was not necessary.

Noise

Noise impacts were considered significant if they would be of long-term nature and would cause people to be continuously exposed to levels over those normally found in a suburban environment, about 50-55 decibels. Especially sensitive receptors (e.g., hospitals, or schools) were not identified in proximity to the proposed action or alternatives.

CULTURAL RESOURCES

A synoptic BLM Class I inventory was conducted for the proposed and alternative routes. The inventory provides an overview of the prehistory, ethnohistory, and history within the potentially affected geographic region. Site record compilation was conducted for a one-mile-wide study area centered on the proposed and alternative routes. The inventory provides the basis for identification of known and potentially sensitive areas such as those with high site density; areas with National Register of Historic Places eligibility; and areas where, because of environmental conditions, there is a high probability of containing resources. The Class I inventory serves as the technical background document and as a planning tool for conducting the Class III field survey along the right-of-way.

Potential impacts were assessed for significance in terms of applicant-initiated mitigation measures and agency compliance procedures using the following criteria of significance.

Criteria for evaluating newly discovered sites and assessing National Register eligibility were taken from 36 CFR Part 60. The criteria for determining the effect of construction on an archaeological site were taken from 36 CFR Part 800.3. An effect occurs when an undertaking changes the integrity of location, design, setting, materials, workmanship, feeling, or association of the property that contributes to its significance in accordance with National Register criteria. Criteria for adverse effect include:

- destruction or alteration of all or part of a property
- isolation from or alteration of the property's surrounding environment
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
- neglect of a property resulting in its deterioration or destruction
- transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use

The National Park Service has proposed a management plan for the preservation of historic trails. The applicant has indicated a willingness to comply with this proposed management plan, where practical. Impacts to historic trails will not be fully identified until after the completion of the Class III field survey.

Impacts were considered significant if there is a reasonable probability that a resource eligible for the National Register of Historic Places could be damaged or destroyed as a result of the proposed action or alternatives.

APPENDIX B

GLOSSARY

Animal-unit month - the amount of feed or forage required by an animal-unit for one month. An animal-unit is considered to be one mature (1000 lb) cow or the equivalent based upon average daily forage consumption of 26 pounds dry matter per day.

Absolute density - an animal community measure which considers the total number of individual animals per unit area.

Barrels Per Day (BPD) - a unit measuring the rate at which petroleum is produced, transported, or consumed. (Barrel is a unit of volume measure equal to 42 U.S. gallons).

Block Valve - a valve that can be shut off manually or remotely to prevent flow in either direction, as in a pipeline.

Check Valve - a valve with a free-swinging tongue or clapper that permits liquid to flow in one direction only, as in a pipeline.

Community - a group of animal species and individuals which occur in a specific habitat or habitat type and have relationships of varying types between them.

Contrast - the difference between adjacent parts in color and form, as used in BLM VRM System.

Crucial winter range - range which is present in minimum amounts and is the determining factor in the potential for population maintenance and/or growth. This is usually represented by a winter concentration where most individuals of a population are forced during periods of maximum snow cover each year or where most individuals of a population are concentrated during periodic severe winters.

Crucial winter/yearlong range - similar to crucial winter range but occupied in the winter and all other periods of the year.

Ephemeral Stream - a stream which flows only in direct response to precipitation in the immediate watershed or in response to the melting of a cover of snow and ice, and which has a channel bottom that is always above the local water table.

Form - the mass or shape of an objective or objects that appears unified, such as in the shape of the land surface, as used in BLM VRM System.

Gate Valve - a valve with a solid gate closing element that fits tightly over an opening through which petroleum products pass in a pipeline; can be shut off to prevent flow.

Intermittent Stream - a stream or reach of a stream that drains a watershed of at least one square mile, or stream or reach of a stream that is below the local water table for at least some part of the year, and obtains its flow from both surface runoff and ground water discharge.

Line - the path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture. Within the landscape, lines may be found as ridges, skylines, structures, changes in vegetative types or individual trees and branches, and used in BLM VRM System.

Perennial Stream - a stream or part of a stream that flows continuously during all of the calendar year as a result of ground-water discharge or surface runoff. The term does not include intermittent stream or ephemeral stream.

Plant Succession - the process of vegetational development whereby an area becomes successively occupied by different plant communities of higher ecological order.

Prime Farmland - land best suited for producing food, feed, forage, fiber and oil seed crops and also available for these uses (the land could be cropland, pastureland, rangeland, forest land or any other land but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

Rangeland - land undisturbed by cultivation capable of growing native and adapted plant species for the purpose of domestic livestock grazing.

Riparian habitat - a vegetative habitat comprised of trees, shrubs, grasses, or forbs distributed in narrow strands on the banks or floodplains of streams or rivers.

Salmonid - fishes of the family Salmonidae (whitefish, char, trout).

Scenic Quality - the degree of variety within a landscape, measured as distinctive, common, or minimal. The measurement of scenic quality is based on the premise that landscapes with the most variety or diversity have the greatest potential for high scenic value, as used in BLM VRM System.

Scour - to wash away or remove materials as by a swift current of water in a stream channel.

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READEX

Seen-Area - the perspective of the visual resource is within clear viewing distance of public use areas (roadways, recreation sites).

Species composition - an animal community measure which considers the animal species which comprise the community.

Species diversity - an animal community measure which considers the number of species in a community in relation to their individual relative abundances.

Species richness - an animal community measure which considers the number of species in a community.

Strutting ground - a specific geographic area where a group of male sage grouse perform courtship displays in the presence of a group of females. Strutting grounds are typically used many years in succession.

VRM (Visual Resource Management) - the planning, design, and implementation of BLM management objectives to provide acceptable levels of visual impacts for all BLM resource management activities. VRM Classes are based on visual quality characteristics, sensitivity, and viewing distance criteria.

1. Class 1. This class provides primarily for natural ecological changes; however, it does not preclude very limited management activity. Any contrast created within the characteristic environment must not attract attention. It is applied to wilderness areas, some natural areas, wild portions of the Wild and Scenic Rivers, and other similar situations where management activities are to be restricted.

2. Class II. Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape. A contrast may be seen but should not attract attention.

3. Class III. Contrasts to the basic elements (form, line, color, texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the existing characteristic landscape.

4. Class IV. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, texture) inherent in the characteristic landscape.

5. Class V. Change is needed or change may add acceptable visual variety to an area. This class applies to areas where the naturalistic character has been disturbed to a point where rehabilitation is needed to bring it back into character with the surrounding landscape. This class would apply to areas identified in the scenic evaluation where the quality class has been reduced because of unacceptable cultural modification. The contrast is inharmonious with the characteristic landscape. It may also be applied to areas that have the potential for enhancement, i.e., add acceptable visual variety to an area/site. It should be considered an interim or short-term classification until one of the other VRM class objectives can be reached through rehabilitation or enhancement. The desired Visual Resource Management class should be identified.

Visual Sensitivity - a measure of viewer interest in the scenic qualities of the landscape, as used in BLM VRM System.

Wintering area - a specific habitat occupied by a winter concentration of sage grouse.

APPENDIX C

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APPENDIX D

ADDENDUM TO THE DEIS ON THE FRONTIER PIPELINE COMPANY CRUDE OIL AND CONDENSATE PIPELINE

INTRODUCTION

The Bureau of Land Management (Lead Agency) and Woodward-Clyde Consultants have prepared a Draft Environmental Impact Statement (DEIS) assessing the environmental effects of granting right-of-way for a 287-mile, 16-inch crude oil and condensate pipeline. The proposed pipeline would extend from the Anschutz Ranch East Field in southwest Wyoming and northeast Utah to Casper, Wyoming. This addendum to the DEIS addresses the environmental effects resulting from the addition to the original 287-mile route of 1.2 miles of pipeline with a 50-foot permanent right-of-way plus 50 feet of temporary construction use space, and the relocation of the Originating pump station to a site in Summit County, Utah. The components of the 25-acre Originating pump station would remain the same as in the original analysis.

The new terminus of the pipeline (milepost - 1.2) and Originating pump station are located in Summit County, Utah, Sections 20 and 21, in Township 4N, Range 8E; the pipeline extension (to milepost 0) crosses into Uinta County, Wyoming, Sections 26 and 27, Township 13N, Range 121W. The pipeline would directly affect 14.55 acres during construction and 7.28 acres during operation. The Originating pump station would disturb approximately 25 acres of land. Three 150,000-barrel storage tanks would be located at the Originating pump station. The pipeline extension and the pump station are located on private land.

This addendum addresses only the additional environmental effects resulting from the changes in the proposed action. Environmental Research & Technology, Inc. (ERT), analyzed the environmental effect of these changes. Woodward-Clyde Consultants (WCC) determined the significance of the effects based on the information provided by ERT. The environmental effects from the original 287-mile pipeline route and associated facilities are addressed in the DEIS and the supporting technical reports.

AFFECTED ENVIRONMENT

This section of the addendum describes the affected environment for the area traversed by the 1.2-mile extension of the Frontier Pipeline Company Crude Oil and Condensate Pipeline and the new site of the Originating pump station (see Map 1-1 in Chapter One of the DEIS).

The Originating pump station is located in Summit County, Utah, in Sections 20 and 21, Township 4N, Range 8E; the pump station is approximately one-half mile due west of the East Anschutz plant. The 1.2-mile extension to the proposed pipeline runs in an east-northeast direction for 0.4 miles, crossing into Uinta County, Wyoming, at the southwest corner of Section 27, Township 13N, Range 121W. The pipeline continues in a northeast direction for 0.8 miles to the former terminus (milepost 0), north of the Amoco East Anschutz plant site. The area traversed by the corridor extension is hilly terrain with considerable ongoing disturbance from oil and gas exploration and drilling activities.

The affected environment is described for the following resources:

- Vegetation
- Livestock Grazing
- Aquatic Biology
- Wildlife
- Paleontology
- Soils and Prime Farmland
- Water Resources
- Social and Economic Conditions
- Recreation
- Wilderness Values
- Visual Resources
- Cultural Resources
- Mineral Resources
- Geologic Hazards
- Climate, Air Quality, and Noise

Vegetation

The vegetation of the 1.2-mile addition to the proposed pipeline and the new 25-acre Originating pump station site consists primarily of the sagebrush-grass type. Principal species include big sagebrush (Artemisia tridentata), green rabbitbrush (Chrysothamnus viscidiflorus), wheatgrass (Agropyron sp.) and needlegrass (Stipa sp.). The riparian zone along Thief Creek consists primarily of an herbaceous community dominated by sedges (Carex) and rushes (Juncus). This riparian zone is approximately 100 feet wide.

Livestock Grazing

Sheep and a limited number of cattle graze rangelands in the area of the proposed pipeline extension and the new Originating pump station during the spring and summer. Stock ponds have been developed on Thief Creek to provide a constant supply of stock water during the grazing season.

Aquatic Biology

The 1.2-mile addition to the proposed pipeline would cross Thief Creek in Utah (Section 21, Township 4N, Range 8E). Thief Creek is a marginally perennial to intermittent stream with an average discharge of about 3 to 5 cubic feet per second. There are beaver ponds 1 to 2 miles upstream from the proposed pipeline crossing. Thief Creek has not been classified according to the Utah Division of Wildlife Resources (Wilson 1982), and is unclassified according to the Wyoming Game and Fish Department; it is unlikely that this stream would support a fishery (Stone 1982). This stream has been previously disturbed by oil and gas activity upstream of the proposed pipeline crossing. An existing sedimentation pond approximately one-quarter mile downstream is designed to catch sediment from the ongoing construction and operation activities. Yellow Creek, into which Thief Creek drains, is a marginally perennial to intermittent, Class 4 stream (Stone 1982).

Wildlife

The major vegetative type of the proposed 1.2-mile pipeline extension is sagebrush-grass. The proposed pipeline extension would pass through mule deer and moose winter range; this range is not considered crucial according to the Wyoming Game and Fish Department (June 1982). The area is also mule deer and elk summer range, and cougar are known to inhabit the area; the Utah Division of Wildlife Resources does not consider this crucial summer range (Wilson 1982).

There are no raptor breeding grounds or sage grouse strutting grounds in the study area, but it is within a sage grouse wintering area. The Utah Division of Wildlife Resources considers all sage grouse wintering areas to be potentially crucial habitat, depending on the nature of the activity, the season of occurence, and the location (Wilson 1982).

No herds of wild horses have been recorded in the study area (Howard 1982).

Paleontology

The 1.2-mile pipeline extension and the Originating pump station are included in the Foothills physiographic unit; the sensitivity of this area to project-related disturbance has not been assessed.

Soils and Prime Farmland

Soils in the area of the proposed pipeline extension and Originating pump station are included in the Foothills physiographic unit. Soils in this physiographic unit include ustic torriorthents, borallic camborthids, cryoborolls, and typic cryorthents. These generally shallow soils are located on upland sites (hillsides, ridges). Approximately 0.2 acres of the Terrace and Piedmont physiographic unit are at the Thief Creek crossing. Soils in this unit include argic physiographic, typic cryoborolls, and typic cryarquolls. These soils are generally deep and fairly moist.

There is no Prime Farmland along the proposed pipeline extension or at the site of the Originating pump station. Temperatures are too cold, and the terrain is generally too steep for Prime Farmland.

Water Resource

The Originating pump station and part of the 1.2-mile pipeline extension would be located in the Thief Creek watershed. The pipeline would cross Thief Creek approximately 0.1 mile east of the proposed pump station. Thief Creek is shown as a perennial stream by the USGS

(Porcupine Ridge 7.5' Quad); it is in the Bear Creek drainage. Average annual flow is estimated to be 3 to 5 cubic feet per second, and the stream may become intermittent during the summer months. The watershed above the pipeline crossing is estimated to be 2000 acres. Stock dams have been built across Thief Creek at several locations below the pipeline crossing. No water quality data are available for this stream. Yellow Creek, to which Thief Creek is tributary, is classified as a Class 4 stream by the Wyoming Game and Fish Department (Stone 1982).

The Originating pump station is located outside the 100-year floodplain.

Social and Economic Conditions

There are no permanent residences in the immediate vicinity of the proposed pump station and pipeline extension; a large temporary work force is housed at the man camp at the Amoco East Anschutz plant site. The area is crossed by the pipeline extension is also part of the Anschutz Ranch, an active livestock operation.

The population of Coalville, the nearerst town in Utah to the proposed pipeline extension and pump station, was 864 in 1970 and 1,031 in 1980 (U.S. Department of Commerce 1982). The entire population of Summit County was 5,879 in 1970 and 10,198 in 1980 (U.S. Department of Commerce 1982).

The tax revenue collected by Summit County in 1981 was approximately $1,585,000. The North Summit County School District collected approximately $2,754,000 (Utah State Auditor's Office 1982).

Recreation

There are no major recreation resources within the area of the proposed pipeline extension or Originating pump station as defined in the Recreation Technical Report (WCC 1982). This area is on private land; access is limited to the residents of the man camp at the East Anschutz plant.

Wilderness Values

The proposed 1.2-mile pipeline extension and Originating pump station do not cross within the jurisdictional boundaries of any formally designated wilderness areas or wilderness study areas. The wilderness values of the 1.2-mile pipeline extension and Originating pump station are similar to the wilderness values described for the rest of the proposed Frontier pipeline (WCC-Wilderness Values Technical Report 1982).

Visual Resources

The Originating pump station would be located at 7,350 feet elevation on the eastern side of a ridge. The 1.2-mile pipeline extension and the pump station are located on private land in hilly terrain; the pump station would be visible to the residents of the man camp at the East Anschutz plant and workers at oil and gas wells and associated facilities in the area. The landscape in the area has been modified by previous oil and gas activity.

Cultural Resources

A BLM Class I inventory was conducted along the proposed pipeline route in Section 26, Township 13N, Range 121W in Wyoming (Commonwealth Associates 1982). No cultural resources were located along the portion of the 1.2-mile pipeline extension located in this section.

A computer search by the State of Utah Department of Community and Economic Development, Division of History (Utah State Historical Society) indicated that no cultural resources had been recorded along the 0.4 miles of the proposed pipeline extension in Utah (Manion 1982).

Mineral Resources

The proposed 1.2-mile pipelne extension and Originating pump station are located on private land, for which there are no formal plans for mineral resources development.

Geologic Hazards

The pipeline extension and Originating pump station are located in the Foothills physigraphic province. Topography in the study area consists of a long, gently sloping ridges that extend from Porcupine Ridge. Small streams (e.g., Thief Creek) dissect these ridges in a generally northeast direction. Sideslope angles of the Thief Creek drainage in the vicinity of the pipeline crossing are estimated to be 20%. No springs or seeps are present on the pipeline route or pump station site, based on inspection of USGS maps and aerial photography. Geotechnical data collected for the East Anschutz production facility (Dames and Moore 1981) indicate the clayey and silty soils and subsoils occupying a depth of 6 to 12 feet exhibit high strength and low compressibility characteristics and are essentially non-moisture sensitive. Bedrock on the site consists of sandy siltstones and silty claystones that are weathered and highly fractured, but are equivalent to strong and incompressible soils. Headward streamcutting by Thief Creek has largely been controlled by stock and sedimentation dams above and below the pipeline crossing.

Climate, Air Quality, and Noise

The climate, air quality, and noise conditions along the 1.2-mile pipeline extension and at the site of the Originating pump station are similar to the conditions described for the original proposed Frontier pipeline (WCC-Climate, Air Quality, and Noise Technical Report 1982).

ENVIRONMENTAL CONSEQUENCES

This section addresses the additional environmental effects of the 1.2 mile extension of the pipeline corridor and the relocation of the Originating pump station. Environmental impact analyses were conducted for the following resources:

- Vegetation
- Livestock Grazing
- Aquatic Biology
- Wildlife
- Paleontology
- Soils and Prime Farmland
- Water Resources
- Social and Economic Conditions
- Recreation
- Wilderness Values
- Visual Resources
- Cultural Resources
- Mineral Resources
- Geologic Hazards
- Climate, Air Quality, and Noise

The analysis of environmental effects for the pipeline extension and new pump station site is based on the significance criteria (frameworks for analysis) used to analyze the effects of the original 287-mile Frontier pipeline route. These criteria are described in Appendix A of the DEIS and in the individual technical reports.

Vegetation

The construction of the additional 1.2 miles of pipeline and relocation of the Originating pump station would result in the removal of vegetation from the pump station site and the pipeline route. An estimated 0.2 acres of riparian vegetation would be disturbed; 39.3 acres of the sagebrush-grass community would be affected. Indirect impacts include temporary loss of wildlife habitat and grazing resources.

The maximum percentage of the total area of the sagebrush-grass vegetation type which would be lost due to pipeline construction (including the 1.2-mile extension) in geographic area unit 1 is 0.04 percent. This impact is considered insignificant. Potential impacts to the riparian vegetation along Thief Creek are also considered insignificant.

Livestock Grazing

The principal impact to grazing resulting from the 1.2-mile pipeline extension and pump station relocation would be the clearing of approximately 39.5 acres of native vegetation during construction. Assuming a carrying capacity of 15 acres/animal unit month (AUM) for the shrub-herb type (WCC-Livestock Grazing Technical Report 1982), 2.6 AUMs would be removed from the grazing resource. Assuming that the pipeline corridor would be fully reclaimed after five years to a grass forb type (11 acres/AUM), approximately 1.3 AUMs would be restored on the 14.5 acres of right-of-way. The 25 acres containing the pump station would be removed from forage production for the life of the project.

The maximum percentage of total AUMs lost as a result of pipeline construction (including the 1.2-mile extension) in geographic area unit 1 is 0.04 percent. This impact is considered insignificant for both the short-term and long-term.

Aquatic Biology

The crossing of Thief Creek by the 1.2-mile extension to the proposed pipeline would cause a temporary increase in sedimentation during construction. The existing sedimentation pond approximately one-quarter mile downstream of the proposed crossing is designed to reduce the amount of sediment entering the stream. Based on the existing information of the Wyoming Game and Fish Department, it is not anticipated that the proposed pipeline crossing of Thief Creek would affect any recreational fishery resources.

It is anticipated that aquatic biological disturbance associated with the Thief Creek pipeline crossing would be localized and of short duration (i.e., would effect one year class at the most). Therefore, this impact is considered insignificant.

Wildlife

The 1.2-mile pipeline extension and Originating pump station would disturb approximately 39.3 acres of sagebrush-grass community, affecting mule deer, moose, and elk summer and winter range. The pipeline route and pump station are also located in a sage grouse wintering area; according to the Utah Division of Wildlife Resources, this habitat is considered crucial (Wilson 1982). These areas have been previously disturbed by ongoing oil and gas activities. Assuming these areas are reclaimed after construction, these effects would be temporary in nature. Increased human activity in the area would indirectly affect wildlife in these range areas.

No wild horses would be affected by the pipeline extension or relocation of the Originating pump station (Howard 1982).

The 1.2-mile pipeline extension and Originating pump station would not affect any pronghorn or mule deer crucial winter range or crucial winter/yearlong range; therefore, potential impacts to these species are not considered significant.

Construction of the proposed pipeline, including the 1.2-mile pipeline extension and Originating pump station, would disturb approximately 0.2 percent of a 25-square mile sage grouse wintering area. This impact is not considered significant.

Paleontology

A Class I paleontology survey was conducted of the original 287-mile pipeline route, and the route was classified into three levels of sensitivity of particular areas to project-related disturbance (WCC-Paleontology Technical Report 1982). The high-sensitivity areas with geological exposure were then inventoried to determine the presence of paleontological resources. The closest location of a known paleontological site to the 1.2-mile pipeline extension was approximately 40 miles to the northeast of milepost 0.

The 1.2-mile pipeline extension and the new Originating pump station site are included in the Foothills physiographic unit, as is the adjacent segment of the original pipeline route (milepost 0-1). The milepost 0 to 1 segment was included in the paleontological inventory, and no resources were located (Powers Elevation 1982). Although an inventory has not been conducted along the new segment of the pipeline or at the site of the Originating pump station, from surveys on adjacent areas it is not expected that any paleontological resources would be present in these areas (Williams 1982).

The available paleontological and overburden depth data for the 1.2-mile pipeline extension and Originating pump station are not sufficient to accurately determine whether or not pipeline trenching and pump station construction would disturb significant fossiliferous deposits; therefore, the significance of potential impacts is unknown.

Soils and Prime Farmland

Approximately 39.5 acres would be exposed to greater soil erosion potential when vegetation is cleared during construction of the 1.2-mile pipeline extension and the 25-acre site of the Originating pump station. The erosion control and reclamation measures described in Chapter One of the DEIS would help to minimize soil losses. Any soil lost to water erosion in the Thief Creek drainage would be trapped in downstream sedimentation and stock ponds.

No Prime Farmland would be affected by the proposed pipeline extension or the relocation of the Originating pump station.

As long as the aforementioned erosion control and reclamation measures are implemented, no significant impacts to the soils resource are expected to result from construction, operation, maintenance, or abandonment of the 1.2-mile pipeline extension or Originating pump station.

Since no Prime Farmland exists near the 1.2-mile extension or Originating pump station, no impacts to Prime Farmland are expected.

Water Resources

The principal impact on surface water resulting from construction of the Originating pump station and 1.2-mile additional pipeline segment would be increased sediment movement in Thief Creek as the result of soil disturbance during construction. Since construction would be conducted during low flow, it is anticipated that there would be little change in the sediment yields of the stream. Any excess sediment would be trapped behind a sedimentation pond dam, upstream of the stock ponds and Thief Creek's confluence with Yellow Creek. No flooding impacts to the pump station are anticipated, since the station would be located at least 40 feet higher than the Thief Creek streambed. No water would be obtained from Utah for use in hydrostatic testing, and no hydrostatic testing water would be discharged into Thief Creek.

The original location of the Originating pump station at 7,350 feet elevation was determined to be outside of the 100-year floodplain (WCC-Water Resources Technical Report 1982). Therefore, it is anticipated that the new Originating pump station, also at 7,350 feet elevation, would not be affected by the 100-year storm event.

No significant adverse impacts on water resources are expected to result from construction of the 1.2-mile pipeline extension and Originating pump station, assuming all applicable laws and regulations (regarding surface water appropriations and discharges) are adhered to.

The potential operational effects of an accidental crude oil or condensate spill are considered in the Oil Spill Analysis Technical Report (WCC 1982).

Social and Economic Conditions

The primary social and economic impacts of the entire pipeline corridor include employment and population increases, associated demands on local communities for housing facilities and services, fiscal benefits and costs, and effects on social well-being. These are described in detail in the Social and Economic Conditions Technical Report (WCC 1982) and the DEIS. The following discussion addresses only those impacts directly associated with the corridor extension, i.e., by exclusion of effects which would occur independent of extending the proposed pipeline corridor.

Employment. It is assumed that no new construction or operation employment would be required to build or maintain the additional pipeline segment. Since construction of the Originating pump station was included in the original analysis, no additional time is assumed for that activity. Because the new pipeline segment is directly adjacent to the original route, no changes in employee residential distribution patterns and associated public infrastructure demands are anticipated, other than the increase in the duration of their tenure. There is the slight possibility that relocation of the Originating pump station in Summit County could result in a number of the 10 to 15 construction workers associated with the facility finding temporary residences in Utah, e.g., Coalville, since secondary road access does exist. A more detailed analysis of access routes, commuting patterns, and housing availability would be necessary before such a determination could be made. Pipeline maintenance and operation functions would be performed by the expanded permanent work force to be employed at the Evanston District Office.

Income. Assuming a maximum monthly payroll of $600,000 for a 125-worker construction spread, the net personal income increase associated with the pipeline extension and pump station would be approximately $70,000, of which a portion would be spent locally, mostly in Evanston, (see Social and Economic Conditions Technical Report for local disposable income and spending assumptions).

Tax Base. The estimate of the total projected property tax revenue to be generated to Uinta County by the proposed pipeline is $33,970 in 1987 (1982 dollars); this amount has been adjusted to reflect the relocation of the Originating pump station to Summit County and the addition of 0.8 miles of pipeline (Grimes 1982). The change in property tax revenue from the additional pipeline is minor, assuming a taxable capital investment cost of $7,800 per mile.

Summit County, Utah, would gain an additional $27,000 in property tax revenues generated by the pump station and 0.4 miles of pipeline corridor (Grimes 1982). These revenue increases represent a moderate long-term benefit to the existing tax base of Summit County and the North Summit County School District, particulary since any population-related demands on Summit County jurisidictions resulting from pipeline construction and operation are assumed to be negligible.

Transportation. There are not expected to be any effects on transportation associated with the changes in the proposed action. As mentioned in Social and Economic Conditions, there is slight possibility that a small number of construction workers could establish temporary residence in the vicinity of Coalville, Utah. Assuming worst case, this would cause a temporary increase of 10 to 15 vehicles per day in the traffic on the secondary road connecting with Interstate 80 near Coalville.

Summary. The potential impacts on income, tax revenues, and transportation associated with construction, operation, maintenance, and abadonment of the 1.2-mile pipeline extension and Originating pump station are considered insigificant.

Construction of the 1.2-mile extension and Originating pump station would likely contribute temporarily to the current housing shortages in Evanston, Wyoming. This impact is considered to be cumulative and significant.

Recreation

The incremental effects of the pipeline corridor extension on local recreation resources would be negligible, limited to a slightly larger areal extent and duration of outdoor recreation activities such as hunting, fishing, hiking, off-road vehicle use, etc.

No significant impacts to urban or non-urban recreation resources are expected to result from construction, operation, maintenance, or abandonment of the 1.2-mile pipeline extension and the Originating pump station.

Wilderness Values

There are no wilderness areas or wilderness study areas within 10 miles of the proposed pipeline extension or Originating pump station. The proposed extension of the pipeline corridor should not adversely affect any existing wilderness areas or the eleven wilderness study areas (WSAs) described in the Wilderness Technical Report (WCC 1982) due to their distance from the extension area.

Construction of the 1.2-mile pipeline extension and Originating pump station would not have any impact on the wilderness characteristics of any wilderness areas or wilderness study areas.

Visual Resources

The study area for visual resources for the 1.2-mile pipeline corridor extension includes a two-to-three mile corridor consistent with that used along the main portion of the route. According to the BLM Visual Resource Management (VRM) System, the area affected by the pipeline extension is designated as a Class IV landscape (U.S. Department of the Interior 1982); the types of visual disruption and intrusion associated with pipeline construction meet BLM VRM objectives for a Class IV landscape.

Visual consequences associated with construction of the 1.2-mile pipeline extension and Originating pump station would be considered insignificant.

Cultural Resources

A BLM Class I inventory was conducted along the original 287-mile route of the proposed pipeline in Section 26, Township 13N, Range 121W in Wyoming, which includes most of the 0.8 miles included in the proposed pipeline extension (Commonwealth Associates 1982). No cultural resources were located during this survey.

A computer search by the State of Utah Department of Community and Economic Development, Division of History (Utah Historical Society) indicated that no cultural resources had been recorded along the 0.4 miles of the proposed pipeline extension in Utah (Manion 1982).

Based on these studies, there are no known cultural resources along the proposed 1.2-mile pipeline extension or at the site of the Originating pump station. A Class III survey will be conducted along the entire pipeline route and sites of associated facilities (on public land and on private land where the landowner has granted permission for access) prior to disturbance. Any cultural resources found during field inventories would be avoided where practicable. Impacts to cultural resources which are not prudently or feasibly avoidable would be mitigated in accordance with the Historic Preservation Process Memorandum of Agreement. Therefore, no known cultural resources would be adversely impacted by construction, operation, maintenance, or abandonment of the 1.2-mile pipeline extension or Originating pump station.

Mineral Resources

The significance criteria for impact analysis of mineral resources is based on plans for future development of the proposed area of disturbance. The proposed 1.2-mile pipeline extension and Originating pump station are located on private land, for which there are no formal plans for mineral resources development.

No significant impacts to mineral resources would result from construction, operation, maintenance, and abandonment of the 1.2-mile pipeline extension and Originating pump station.

Geologic Hazards

No impacts resulting from geologic hazards are anticipated for the additional 1.2-mile pipeline segment and Originating pump station.

Climate, Air Quality, and Noise

Climate. There would be effect on climate resulting from construction and operation of the additional 1.2-mile pipeline route or the relocation of the Originating pump station.

Air Quality. The effects on air resources from construction and operation of the additional 1.2 miles of pipeline were analyzed using the same methodology used in the calculation of emissions for the remainder of the pipeline (WCC-Climate, Air Quality, and Noise Technical Report 1982).

Total suspended particulates (TSP) in the form of fugitive emissions resulting from construction of the entire pipeline was recalculated to include the 1.2-mile extension. The total emissions are estimated to be 705.8 tons, an increase of 1.3 tons. These calculations assume a construction rate of 1 mile per day per spread. At this rate construction of the additional pipeline would take 1.2 extra days, and the average number of construction days per crew would increase to 72.3 from 72.

Construction vehicle emissions were calculated for CO, HC, NO_2, SO_2, and TSP. Using the methodology that was used to calculate the vehicle emissions for construction of the remainder of the pipeline, there would be no calculated increase in air emissions.

The analysis of operational emissions for the entire pipeline considered fugitive hydrocarbon emissions from the storage tanks (WCC-Climate, Air Quality, and Noise Technical Report 1982). Since the number and configuration of these tanks at the Originating pump station remains unchanged, there would be no increase or decrease in the emissions estimate of 12.6 tons per year. Necessary permits will be acquired by Frontier Pipeline Company prior to construction and operation of storage tank facilities.

Noise. The operation of the proposed extension of the pipeline and relocation of the pump station should not result in an appreciable increase in noise levels in the area; construction-related noise would be temporary. There are no sensitive receptors in the immediate area of the proposed facilities. The only residents of the area are workers based at the temporary camp at the East Anschutz plant site.

Summary. Air quality and noise impacts associated with construction, maintenance, and abandonment of the 1.2-mile pipeline extension and Originating pump station would be localized and of short duration, and are considered insignificant.

Hydrocarbon emissions (12.6 tons per year) estimated for the tankage at the Originating pump station during the operational phase are also considered insignificant.

AGENCIES CONSULTED

Department of the Interior

  Bureau of Land Management
    Utah State Office
    Rawlins District Office
    Rock Springs District Office
    Kemmerer Resource Area

Wyoming State

- Game and Fish Department
  - Cheyenne
  - Green River

Utah State

- Division of Wildlife Resources
  - Ogden
- Tax Commission

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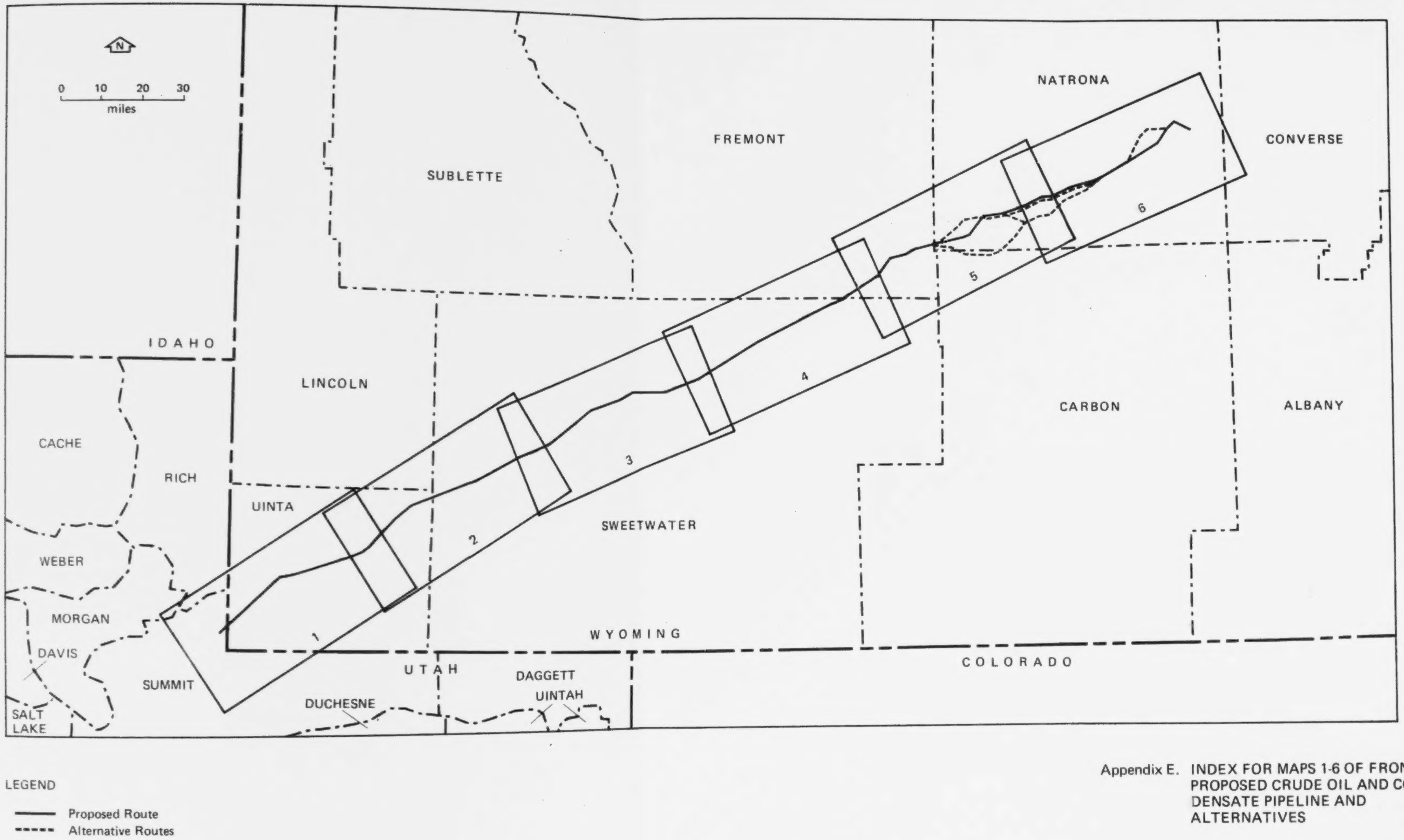
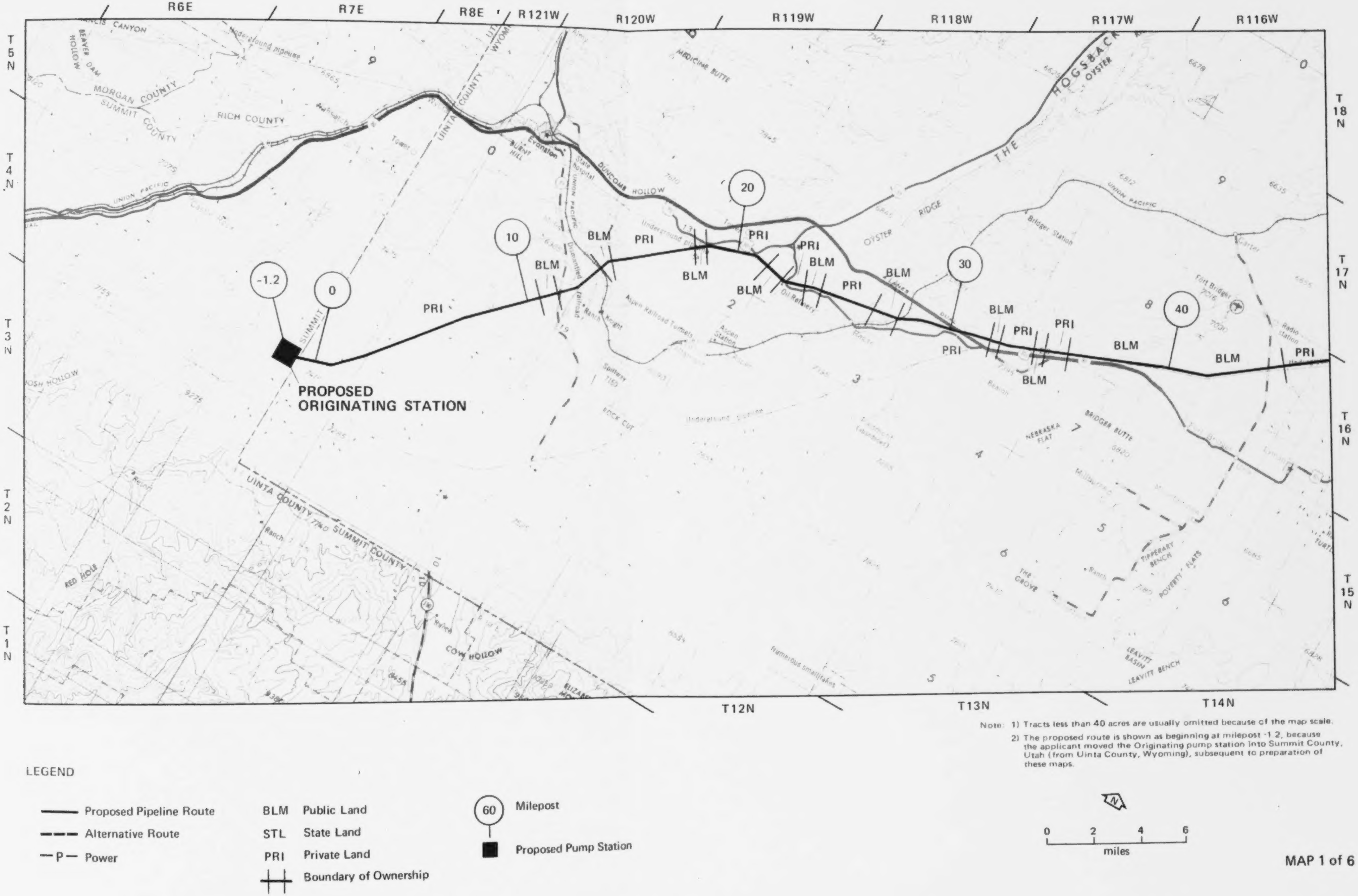
Woodward-Clyde Consultants. 1982. Wildlife Technical Report for the Frontier Pipeline Company Crude Oil and Condensate Pipeline.



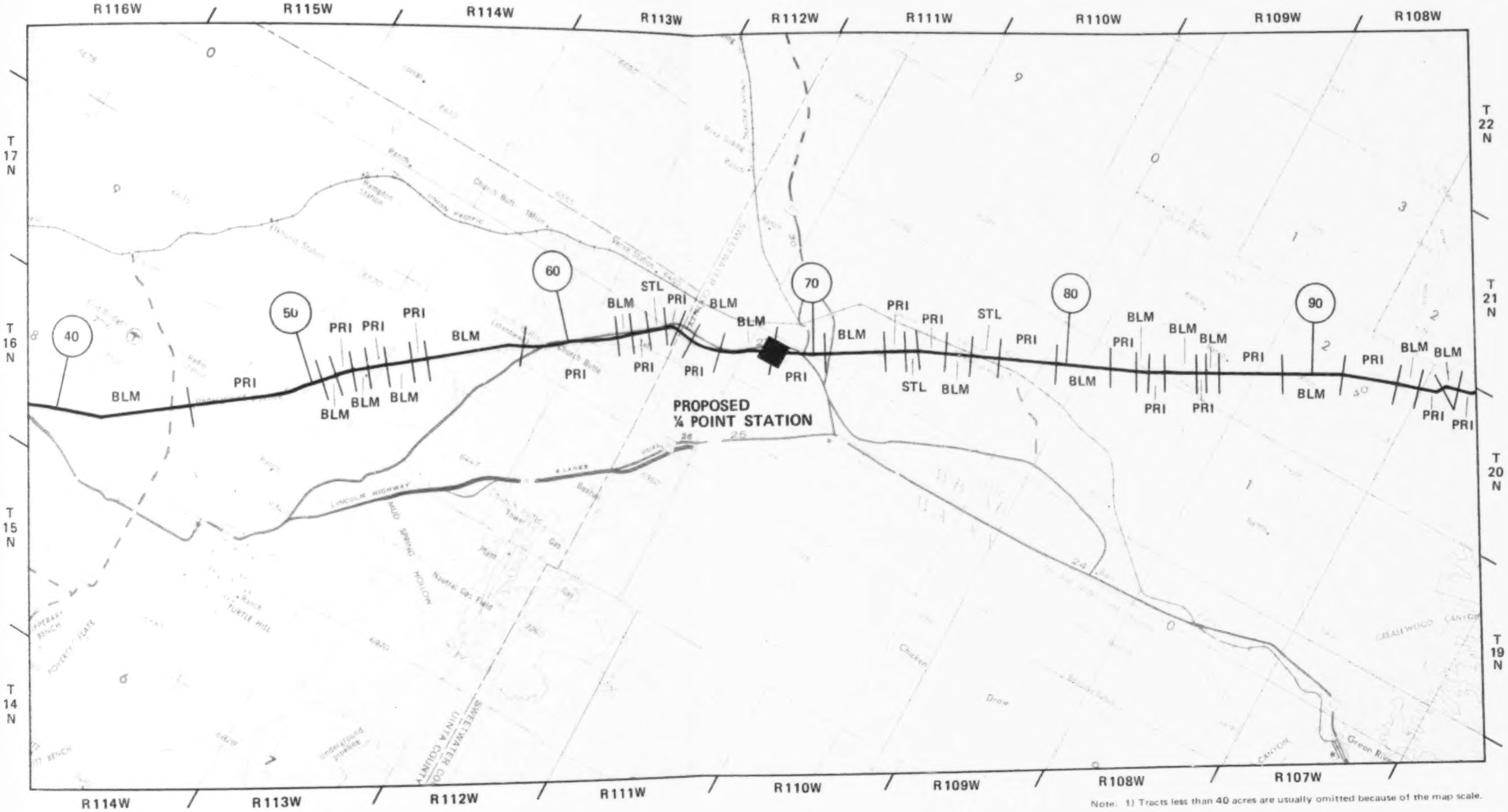
Appendix E. INDEX FOR MAPS 1-6 OF FRONTIER PROPOSED CRUDE OIL AND CONDENSATE PIPELINE AND ALTERNATIVES



Note: 1) Tracts less than 40 acres are usually omitted because of the map scale.

2) The proposed route is shown as beginning at milepost -1.2, because the applicant moved the Originating pump station into Summit County, Utah (from Uinta County, Wyoming), subsequent to preparation of these maps.

MAP 1 of 6



Note: 1) Tracts less than 40 acres are usually omitted because of the map scale.

LEGEND

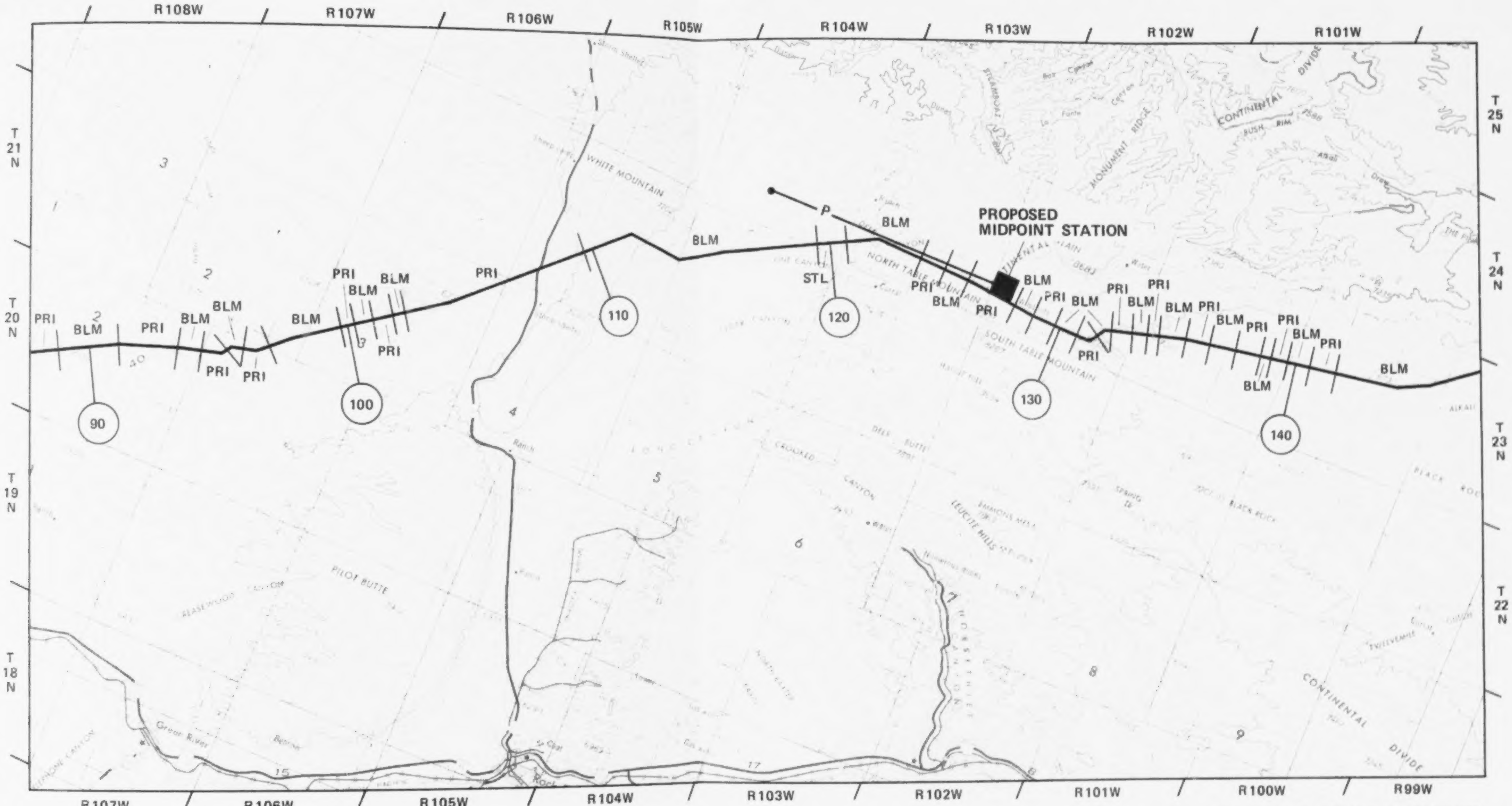
——— Proposed Pipeline Route
– – – Alternative Route
—P— Power

BLM Public Land
STL State Land
PRI Private Land
┼┼ Boundary of Ownership

(60) Milepost
■ Proposed Pump Station

0 2 4 6
miles

MAP 2 of 6



Note: 1) Tracts less than 40 acres are usually omitted because of the map scale.

LEGEND

— Proposed Pipeline Route
- - - Alternative Route
—P— Power

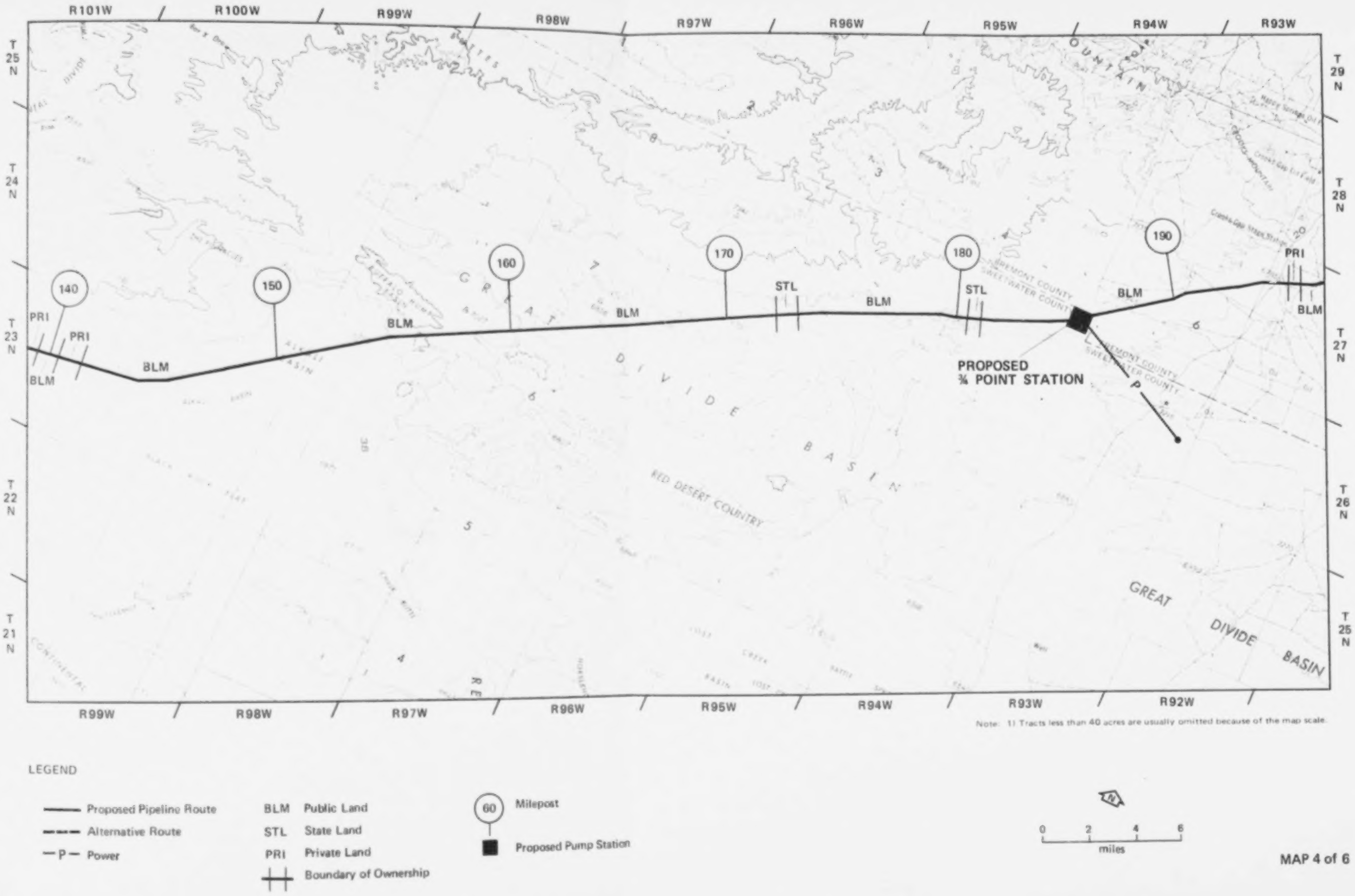
BLM Public Land
STL State Land
PRI Private Land
┼┼ Boundary of Ownership

(60) Milepost
■ Proposed Pump Station

N

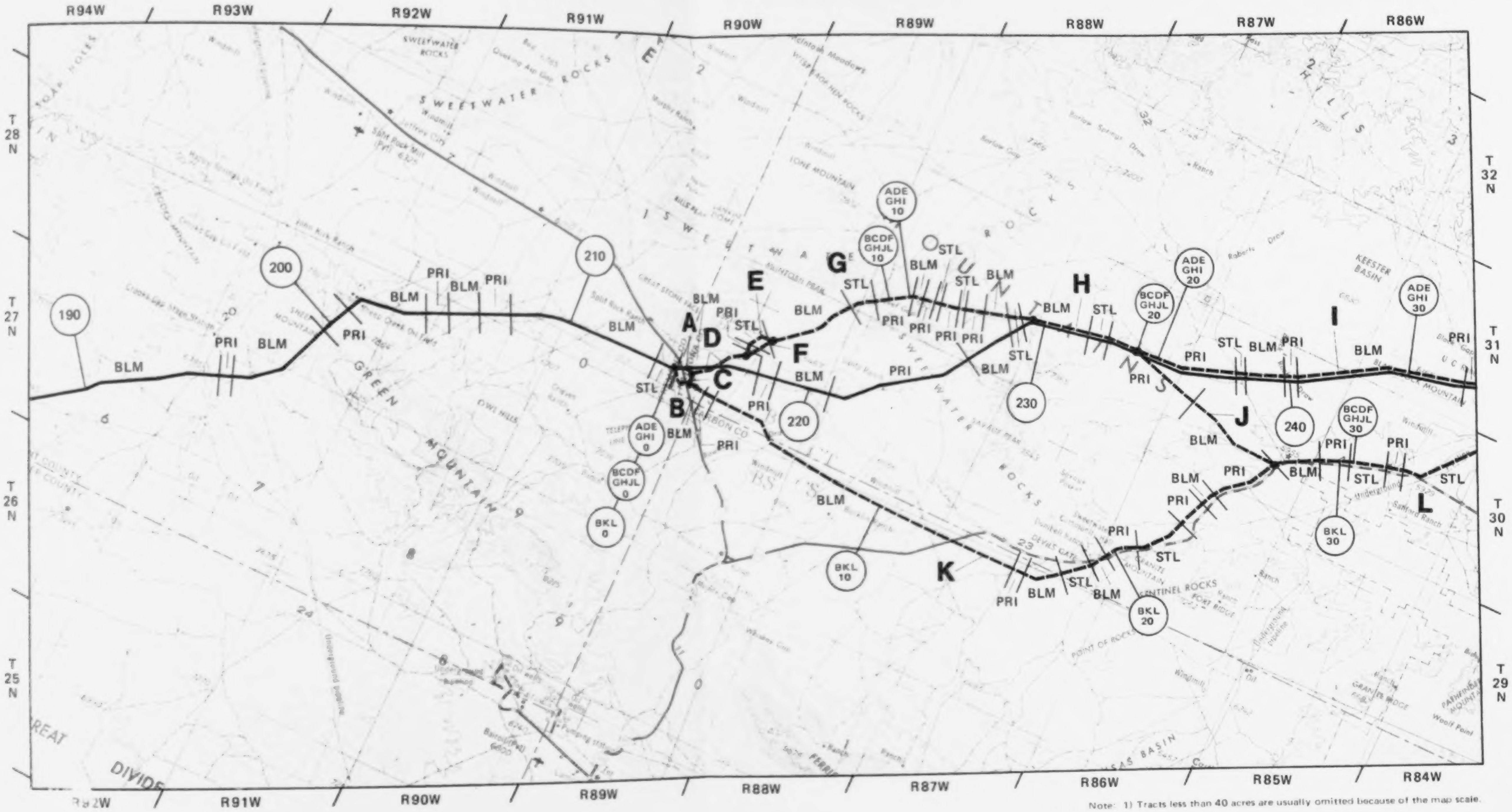
0 2 4 6
miles

MAP 3 of 6



Note: 1) Tracts less than 40 acres are usually omitted because of the map scale.

MAP 4 of 6



Note: 1) Tracts less than 40 acres are usually omitted because of the map scale.

LEGEND

—— Proposed Pipeline Route

– – – Alternative Route

—P— Power

BLM	Public Land
STL	State Land
PRI	Private Land
┼┼	Boundary of Ownership

(60) Milepost

■ Proposed Pump Station

ADEGHI	Beef Gap Alternative *
BCDFGHJL	Beulah Belle Lake Alternative *
BKL	County Line Alternative

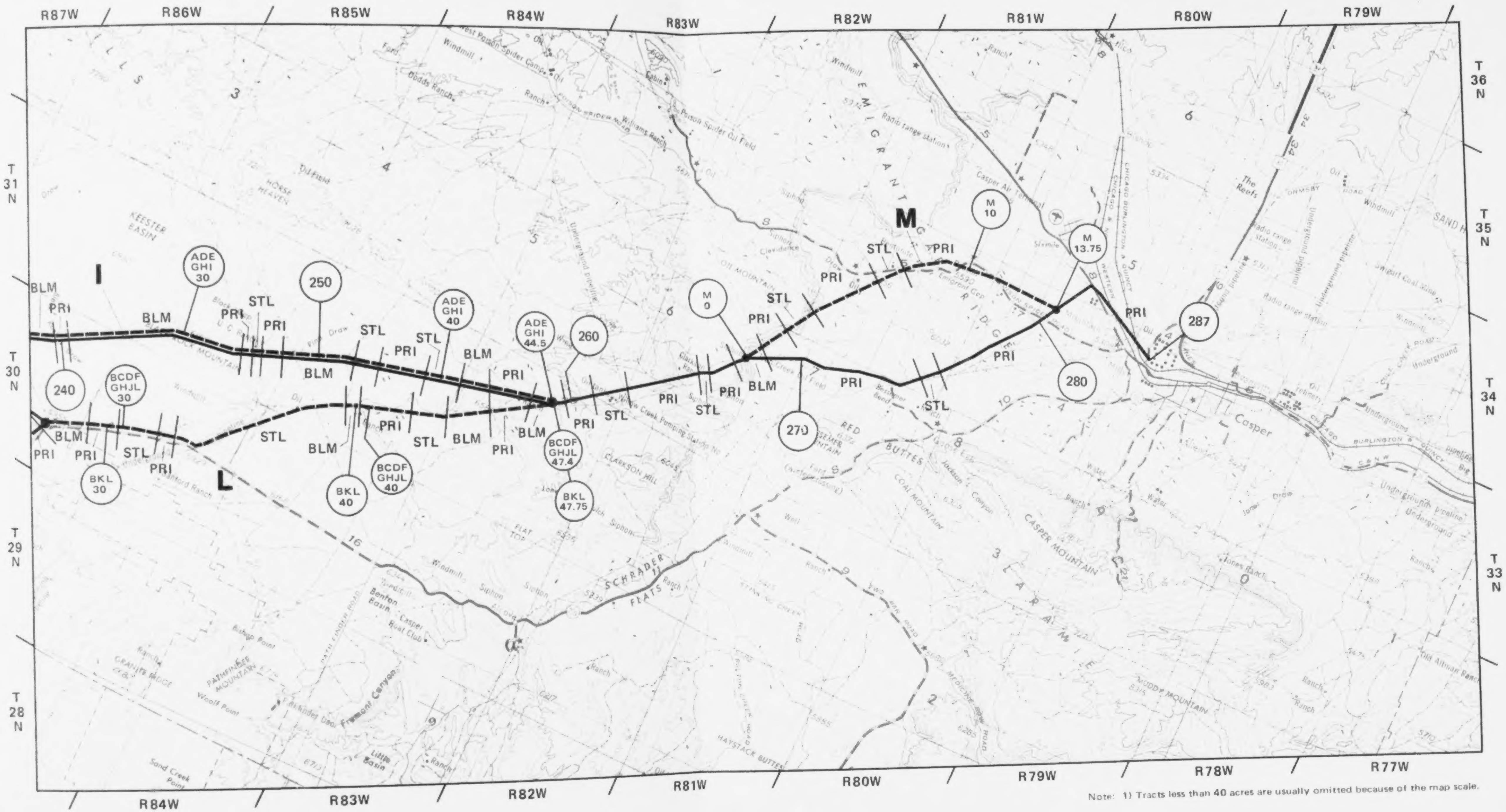
* Segment D of the Beef Gap and Beulah Belle Lake Alternatives is actually two slightly different routes, which could not be portrayed at this scale.

N

0 2 4 6

miles

MAP 5 of 6



Note: 1) Tracts less than 40 acres are usually omitted because of the map scale.

LEGEND

- ━━ Proposed Pipeline Route
- ━ ━ Alternative Route
- —P— Power

BLM	Public Land
STL	State Land
PRI	Private Land
┼┼	Boundary of Ownership

(60) Milepost

■ Proposed Pump Station

ADEGHI	Beef Gap Alternative *
BCDFGHJL	Beulah Belle Lake Alternative *
BKL	County Line Alternative
M	Emigrant Gap Alternative

* Segment D of the Beef Gap and Beulah Belle Lake Alternatives is actually two slightly different routes, which could not be portrayed at this scale.

N

0 2 4 6
miles

MAP 6 of 6

Form 1542-6
(May 1978)

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